The Builder.

Vol. XXXIV. No. 1718. SATURDAY, JANUARY 8, 1876.

ILLUSTRATIONS.

The Royal Society's First House 34
Tomb of the Late Mr. J. R. McClean, C.E., F.R.S., Kensal Green Cemetery 36
Hanover-square Club.—Mr. Robert R. Tyler, Architect 37

CONTENTS.

Houses in Flats for London 33
The Progress of Sanitary Arrangements 37
French and Austrian Bricks 38
Primitive House-building and Architecture 38
Glasgow New Stock Exchange 39
Stir at the Royal Institute of British Architects 39
The Late Mr. John Tarring, Architect 39
Repairs of Chimney-shafts damaged during the Siege of Paris 39
London Bridge Improvement 39
Proposed Separation of Battersea from the Wandsworth District Board of Works 39
The Lantern of Ely Cathedral: Royal Institute of British Architects 39
The Art-Union of London Print 39
An Engineer's Tomb 39
Some Old Houses and their Stories: the Royal Society's First House 39
Hanover-square Club 39
Proposed Changes, Royal Institute of British Architects 39
Great Expansion of the Metropolis 40
Warrington 40
Value of Land, Stockton-on-Tees 41
The Ancient Walls and Forts of Southampton 41
The Theory of Light 41
The Theory of Colour 41
New Public Hall at Huntly, N.B. 41
Treatment of an Architect in the Isle of Man 42
Conveyance of Building Land: Bunton v. Grey and Others 42
"Grinding-money" again: Symes v. Moreland 42
Heating with Hot Water 43
Assessment of a Saw Mill: Norton & Sons, Appellants; the Assessment Committee of Islington, Respondents 43
"Rink" 43
The Public Records 43
How to Raise the Standard of Intelligence and Education in the Building Trade 43
Westminster Aquarium 44
The Albert Starch Works, Paisley 44
Proposed New Public Buildings in Edinburgh 44
The Proposed Channel Tunnel 44
The Strength of Structures 44
Enlargement of the Royal Infirmary, Waterloo-road 44
School Board Schools 44
Church-Building News 44
Miscellanea 45

Houses in Flats for London.

NOT improbably the question of the arrangement of London habitations in separate stories under the same roof, on somewhat the same principle as that so largely exemplified in Paris and, on a somewhat different method, in Edinburgh, will presently come to be seriously entertained as a means of better meeting the wants of an increasing metropolitan population. There is the old theory, no doubt, that the Englishman's house is his castle, still stopping the way to the adoption of this principle of building; and it may be at once conceded that the sentiment of independence and of personal responsibility, which is so marked a feature in the character of the Englishman at home, is better met, and better expressed architecturally, by the separate residence than by the "flat" system; and this same characteristic is far too valuable, especially at a time when individual character is more and more in danger of being merged and lost in the complicated social machinery of modern life, for us to afford to accept inconsiderately any mode of living which may seem to tend towards its further effacement. There is the fact, however, that the system of "flats" is being talked of, and when a thing gets talked of in England that is the most decisive step towards the adoption of it as a fashion, or at least towards the removal of the prejudice against it as "unusual," which is always with us one of the greatest drawbacks to the realisation of whatever schemes are proposed from time to time for our individual or social benefit. A word therefore as to the advantages of the system, and the manner in which it can best be adapted to English habits and requirements, may be in season just now, more especially as the attention of our readers has been called to it recently by Mr. W. H. White's able and very complete papers on the system as carried out in Paris, where he had opportunities of becoming thoroughly acquainted with it.*

A word, we say, on the "advantages" of the system; because its disadvantages, from an English point of view, are too obvious to need comment. We may assume at once that in this country no one who could afford a good house of his own in a good quarter would ever wish to occupy a story of a large building including several other families similarly occupying other stories under the same roof, and with a common entrance. No doubt prejudice has a good deal to do with this. The only experiments on a large scale for housing separate families under one roof in this way have been those made in the shape of "model dwellings" for the "working-classes"; for the large blocks of chambers which exist in the neighbourhood of Westminster and Victoria-street are only partly intended or used as family residences. Independently of this, there is, as Mr. White observed, a tacit feeling that a division by vertical walls affords a much more independent and separate dwelling than a division by horizontal floors, and thus many people who have no objection to live in a mere strip of building disposed vertically, with similar strips on each side of it, would have an innate repugnance to inhabit a strip of precisely similar cubic dimension placed horizontally, and with similar strips above and below it, though the latter would in most cases be by far the more convenient residence to move about in. In the one case there are walls between them and their neighbours, in the other case only floors; the usual arrangement secures to each inhabitant his separate entrance-door and staircase; in the flat system the street entrance and main staircase are necessarily common to the occupants of different flats. This latter consideration is probably the most decisive with the average English tenant, who cannot bear the idea of exchanging his home life for anything approaching to what may be called hotel life; but the first consideration has also its weight, and however disagreeable it is to hear your neighbour's family festivities or family dissensions through an upright wall, it is considered much worse to hear them through a horizontal floor.

This latter *désagrément*, however, is partly, of course, to be attributed to the comparatively slight and sound-conducting construction of floors in English houses, which makes the ordinary lodging-house floor such a weak defence against the neighbours over-head. This may be readily obviated, at no very material increase of expenditure, by making the floors of as solid construction as the walls; and thus the fireproof construction of iron and concrete which was forced on the architect of the Paris *maison à loyer* by a unanimous and suicidal strike of the carpenters, would be forced on the London architect of a similar house by the equally unanimous demand of the tenant for the most complete isolation that could be obtained. Indeed, this condition may be at once accepted as a *sine qua non* in the construction of houses in flats. Supposing the isolation of each tenement thus realised, so far as the effectual shutting out of alien sounds is concerned, the other drawbacks to the system in English eyes are rather sentimental and social than practical, and may be passed over for the moment, while we endeavour to specify some advantages of the flat system to tenant, landlord, and the public at large.

The flat system recommends itself especially to a very large, and we may add in the main a very meritorious, section of society,—those, namely, who, with incomes rather below the average of their class, are desirous nevertheless honestly to live in that neighbourhood, and with that degree of elegance or dignity in their abode and its surroundings to which their inherited social tastes entitle them. This kind of feeling is quite distinct from that desire for show and pretence of "style" which has been so often and justly satirised. On the contrary, the desire for as good and attractive a home as can be attained, the wish "to have things nice about one," is one of the evidences of a refined and cultivated nature, and one of the principal feelings which tend to keep up and to raise higher the standard of civilisation in every-day life. Now the family of small means, but with this kind of (as we hold it to be) healthy aspiration in regard to its mode and place of living, is at present ordinarily compelled to inhabit a slice in one of those rows of small suburban street houses, with bay-windows repeated in "damnable iteration" as far as the eye can conveniently see. These, it is needless to add, are all the work of speculating builders, flimsily and cheaply built, of bad materials, and too often almost criminally deficient in sanitary arrangements. No order of human habitation, except, perhaps, the Irish hovel or shieling, is more utterly at variance with any desire for dignity, comfort, and interest in their daily lives on the part of its occupiers. A country cottage by the roadside is a far more interesting and desirable abode from an æsthetic point of view, though it may not so readily afford the compensating relief of shortening the lives of its inhabitants, in which the Town abode of the class named is perhaps pre-eminent. But the provision of houses built in flats,—and by this we do not imply immense hotel-looking blocks of buildings, with innumerable stories, but houses of an average size, so built and arranged as to accommodate a separate family conveniently and privately on each separate floor,—would afford to those whose tastes in regard to neighbourhood and style of living are, in the present order of things, above their means, the opportunity of living in a better neighbourhood, and in a much better-built house, at the same rate of living required to taste the blessings of a life in No. 201½, or whatever it may be, of the row of bay-windowed "desirable residences." A separate house, of the right size to accommodate a small family with a small income, cannot be built in what are considered either the best or the second best streets, except at a dead loss to the owner, the cost or ground-rent of land being proportionately higher, without taking into account the fact that the laws both of social custom and architectural effect, as well as (in many cases) the hardly more stringent law of "building conditions," forbid the erection of houses greatly at variance, in size and scale, from those prevalent in a given street or district. But the house in flats, on somewhat the same model as the Paris *maison à loyer*, and the Edinburgh house of a similar description, can form, in its outer aspect, a perfectly harmonious and suitable addition to the street architecture of the neighbourhood (without, of course, disguising its real character), while in its internal plan and arrangement it provides for the wants of families who find the neighbourhood in every way suitable to them in regard to

* See vol. xxxiii., pp. 1100, 1131, 1147.

social and æsthetic taste; but who either do not require or do not find it convenient to take possession of a whole house of the scale of those around. So far as the tenant is concerned, therefore, the house in flats may be taken to supply a social and æsthetic demand. The class of tenants we refer to can get a house of the size and accommodation he requires in the speculating builders' districts; but he will have to put up with living where he does not wish to live, and with inhabiting a badly built, ill-drained, rickety dwelling, in a neighbourhood of the most depressing dulness of aspect and character that is conceivable. But if we look at the system from the opposite or landlord's point of view, there is something to be said for it on that side on the score of economy in outlay, and adequate or (which is the same thing) speedy return. A house capable of being let to three or four families at a small rent from each, would often, we can hardly doubt, if once the English prejudice against such an arrangement is overcome, be speedily let at remunerative rents, where a single house of the same size might remain long untenanted. On the other hand, the owner or occupier of building-land in the districts where the row of bay-windows usually predominates, would of course get a better return for his outlay if he could build three or four houses, one over another, on the ground now occupied by, say two of the ordinary tenements, with a good prospect of letting them. Such a prospect, again, depends of course on the view with which the public from among whom the tenants come would regard the system. We should think it, for some time to come at any rate, a much more problematical venture in regard to a third class than to first and second class neighbourhoods, because here the houses in flats are supposed to be erected on the same site as the single houses which they supplant; that is to say, they do not offer any inducement in the way of a better neighbourhood to the tenants, nor do the tenants look for anything of the kind. Their wants, as far as they understand them, are supplied by the ordinary 40*l.* or 50*l.* builder's street-house; and to prove that they would have better chances of comfort and health in a story of a well-built house in flats at the same rent, would be a very long business indeed; though it is almost certain this would be the case, because the house in flats, being an erection of a larger and better kind, almost necessitates better building and more careful planning and sanitary arrangements, while the proportion between the ordinary cost of land and materials and the rent returns would probably be such as to leave a larger margin for expenditure on good workmanship than is the case with the ordinary separate house of this class.

Still, there is not the same inducement for tenants of this class to look with favour on houses in flats. The application of the system to a third-class* neighbourhood, in fact, merely means arranging residences of the ordinary size and rental required by that neighbourhood in groups instead of in separate houses; and those who have to inhabit them are probably just the people to stick by the notion of an Englishman's house (even a jerry-built one) being his castle, and to think that they are being insulted and levelled with the "working classes" by being asked to live in "flats." At the same time, we do definitely think that they could be supplied with better built and healthier houses at the same rent by this system than by the present one; and if that can be proved, the common-sense of English people would probably in the end be found on the side of such a system. The application of the flat system to a first and second-class neighbourhood, on the contrary, means the division of the ordinary size of residence of the neighbourhood into several separate residences, to suit those whose proper place socially is in such a neighbourhood, but whose means or requirements are below the prevalent size of dwelling. These classes are much more likely to consider sensibly, and without prejudice, the advantage of such an arrangement, which to them would moreover be much more of a real advantage, and would, as it appears to us, afford opportunities of getting into their natural and suitable geographical place of abode, without ruinous expenditure, to those whose inherited birthright or intellectually-acquired pre-eminence gives them claim to a status to which their means are but ill-proportioned, and who (the former class especially, but the latter also to a considerable extent) form, as every one knows, no unimportant contingent of even the "best" London society.

And now a few words as to the possible application of the flat system in London, considered from its social, constructional, and architectural points of view respectively. In regard to the first and certainly the most serious and important point, we have already stated what we believe to be the main advantage which the system would offer to dwellers in London. In considering this we have been careful to point out that what we contemplate is not the erection of vast hotel-like edifices in which all character of "home" is destroyed,—at least, not mainly this, though such buildings may possibly have their value in certain places,—but simply the arrangement of buildings in harmony architecturally with the ordinary class of houses in the best streets, but with stories contrived as separate dwellings. We the rather draw attention to this, because the *Saturday Review*, in an article on "Houses *in* Flats," in the number for October 23 last year (on which we have a word to say just now), made the mistake of considering the subject (in reference to a special specimen) almost entirely in this light, and quite overlooked the perfectly different class of building, corresponding to the Paris *maison à loyer*, which it is the aim of some of those who have considered the subject to see introduced among us, and which would be far more homelike and attractive, and of far more use to society in this country, than the establishment of great blocks of building, only differing from hotels in the more permanent occupation of their suites of rooms; and which, however well they may do as "chambers" for single gentlemen or ladies, or men of business, would, we say it without fear of contradiction, never be accepted as a fortunate or suitable way of providing for English family life, unless all our social instincts and feelings are to be altered in a direction which would lead us towards the American hotel system,—from which Heaven preserve us! What we are contemplating is the same kind of provision for families which already exists in London for unmarried people, under the name of "chambers." This latter species of accommodation is probably better provided for and better carried out in London than almost anywhere else. The application of a similar system for the housing of families has, on the contrary, scarcely been tried at all, though it has been long a habitual and recognised system in Paris and Edinburgh. Neither an Edinburgh nor a Paris house, however, would altogether do for transplantation to London. In regard to the Paris house, by far the best planned and most systematically contrived abode of the kind for the requirements of its particular society, not only would the well-known differences in the usual domestic arrangement of a French and English family house necessitate a great difference in planning, but there are objections to the working of the flat system on the Paris plan which would certainly be considered very serious with us. The most important of these is perhaps the manner in which the servants of all the families inhabiting the same house are lodged together in the upper or mansard story, with a separate entrance from the street, and thus entirely apart from all supervision from their employers except when actually on duty. The immorality admitted to be notorious among this class in Paris it is not surprising to hear of under such an arrangement; but an almost equally serious objection to English minds would be the scandal and tittle-tattle which go on continually between servants of different families as to the doings of their several employers, for which the opportunities would thus be multiplied fiftyfold, and which would render all real privacy as to its own concerns an absolute impossibility for any family inhabiting such a house. We may take it for granted that no scheme will be adopted by the English public which does not provide for including "the servants" as part of their own household inhabiting each flat; and that not only for the reasons above hinted at, but for the more honourable motive arising from the principle, which is we believe slowly beginning to permeate English society, that domestic servants ought not to be regarded as mere machines hired to do certain work, but as a portion of the household to which they belong,—as fellow creatures whose interests, mental and material, should be cared for by those with whom they are domiciled. The provision of a separate servants' staircase with a servants' entrance on each flat would of course somewhat complicate the planning, but in houses on a tolerably large scale it could very well be managed; only it should be so placed as to be in the way of being a good deal overlooked by the residents, and not in a too removed and out-of-the-way corner, otherwise the facility for gossip, &c., would be almost as great as in the Parisian system.

In smaller buildings, perhaps a separate servants' entrance from the main staircase would meet the case, and the staircase would then be practically in the position of a part of the common street, extended into the building. This is what the staircase,—the "scale-stair," as it is or used to be called,—in a large proportion of the Edinburgh houses really is; the street-door standing open during the day, or being capable of being opened from the landing on any floor, when the corresponding street-bell is rung. And it has also, as some one remarked in the discussion which followed the reading of Mr. White's paper at the Association, a common property with the street, of being always dirty,—an old charge, referred to more than once in the Waverley novels. A building of this description, in fact, can hardly be kept properly in order without a resident keeper,—the *concierge* of the French houses, who is supposed to be another and very serious stumbling-block to the acceptance of the system in England. The Paris *concierge* is said to be a thorn in the side of society; a domestic spy, a collector and retailer of scandal, a man ready to speak or to hold his tongue only at the instance of bribes from the various residents. But if this is so, does it follow that the porter or doorkeeper in England should be so objectionable as the *concierge* in France? Does not the evil rather rise from social and political tendencies in French society than from anything inherent in the nature of the position? We can see little reason why the doorkeeper in a "flat" home should be any worse, or more objectionable a person, than the "porter" at a club. And if these two objections,—the housing of the servants and the espionage of the *concierge*,—are obviated, there remains only the objection of having a broad, spacious, and well-arranged staircase (and that is a *sine quâ non*) in common between yourselves and your neighbours, in having to meet the next-door neighbour on stone steps as well as on the flags outside. And that surely is not an insurmountable obstacle even to English prejudices (if we are to call them so) about "home."

The influence of any extensive adoption of the flat system on the construction of houses is almost certain to be for good. In the first place the fireproof and soundproof construction of the horizontal as well as of the vertical divisions of the interior is a *sine quâ non*, and must lead to a more solid and durable style of construction than is prevalent in the modern London house at present. The necessity of a superior and solidly built principal staircase would be another influence in the same direction. Then the greater difficulty of the problem of planning and arrangement in such houses, both as to convenience and architectural treatment, will almost necessitate the employment of a mind superior to that of the speculating builder, and might even go far towards getting ordinary town house-building out of the hands of the speculator, and into those of the architect. This, however, is not the view taken by our instructor in the *Saturday Review* aforesaid, who indulges in the sort of charge against the profession with which we are all familiar, and which we must expect to find repeated as long as the editors of literary journals are so ignorant and indifferent on architectural subjects that they are content to give *carte blanche* to any contributor with a "lively pen" to lay down the law and to make whatever statements he may please upon a subject on which he has probably no knowledge or experience whatever. This is a slice of the *Saturday Review* wisdom on the topic:—

> "No two sets of apartments (in a block of 'flat' houses) should be exactly alike, and the architect should not be allowed to settle where the windows are to go till he has designed the inside of the rooms. Uniformity ought to be a matter of no account, and it should not be deemed indispensable for a room to have four corners, each a right angle. . . . . But we may venture to say that the British architect, should a demand arise for flats, with his usual disregard as to who is to live in the places he designs, will make them all exactly alike," &c.

A writer who has no clearer notion of the architectural process of designing a house than is implied by the silly remark about the windows not being settled till the inside of the rooms is designed (as if any architect worth the name ever designed the interior and exterior of his building separately), is probably out of the reach

* We use this general term, the meaning of which will be well understood by most of our readers, rather than adopt the invidious alternative of naming specific districts as examples.

of argument or explanation; and when we find the whole article is *apropos* of an experiment in "flat" building carried out by an amateur architect, and marked by all the irregularities mentioned in the quotation, and which has become, we fear, a permanent blot on the architectural character of the neighbourhood in which it has been erected, it is easy to estimate the real meaning (and value) of the sneer at the professional architect. We may just remind the writer of what he has found it convenient to forget, that scarcely any of the street habitations of modern London are the work of architects at all; and that of the Paris houses in flats, which, except in regard to certain social unsuitabilities of arrangement, are admitted to be almost models in plan and architectural treatment, we know that they are *all built under the supervision of architects*.

As to the influence of the flat system on the architectural character and capabilities of the average-sized house, we can have little doubt, again, that it would be for good, and would present opportunities for improvement on the regulation type of street house, though it probably would be (and, most suitably, ought to be) inferior in architectural pretension and effect to the private house. In regard to the architectural treatment of the house in flats, we may take occasion here to reproduce (in translation) and call attention to the sensible and just remarks of M. Daly, in the introductory chapter to the subject of *maisons à loyer*, to which the second volume of his important work on "*L'Architecture Privée du XIXme Siècle*," is entirely devoted:—

"While the buildings for private residences demand an individual character, and express, within reasonable limits, the life and habits of the family or group of families for whom they are specially constructed, and who intend to take up their permanent residence there, the *maison à loyer*, intended for the many,—that is to say, for a number of tenants succeeding each other from time to time, according to the varying exigencies of their occupation, their several positions, or their means,—inhabited from basement to roof by tenants of different social grades" [this, however, is not a necessary, nor, as we have been looking at the matter, altogether a probable condition in London], "strangers to one another,—cannot admit of any too marked originality of physiognomy. The exterior aspect, as well as the interior distribution of a *maison à loyer* ought to remain, so to speak, *d'une caractère effacé*, and correspond only, in the attempt to satisfy them as fully as possible, to the common tastes and needs of the great mass of the population. . . . . The *maison a loyer* ought not to express its nature by any too exceptional trait. . . . . It is a form of building which gives little suitable scope for the play of fancy. That which it demands above all is the expression of calm practical consideration and reserve. It is not the habitation of an individual or of a family, but of society at large (*de tout le monde*). . . . In fine, we may say, the *maison à loyer* is the commonwealth of architecture, a commonwealth which ought to be distinguished by a common-sense treatment. It must be the property of the many; not as the expression of a passing fashion in architecture, but in virtue of an invariably comfortable and respectable *installation*. Little or nothing, then, can be permitted to the indulgence of fancy, since the fancy of one person is the aversion of another."

These sensible and considerate remarks are perhaps a little on the side of allowing too little to architectural treatment, though we quite concur with M. Daly that the house in flats is not the place for the indulgence of anything exceptional or strongly marked in architectural character. On the other hand, we may point out that the necessarily greater importance given to the entrance, in comparison with a single house of the same size,—more especially if this be, according to the excellent and effective Parisian plan, under cover and in an archway with a carriage passage,—affords a great deal of opportunity for picturesque and pleasing architectural treatment, in a most natural manner, and without going into any "fantasies." The opportunities of effect afforded by the Parisian treatment of the entrance we adverted to in a recent article on the æsthetics of house-building, and the principal staircase affords a means of giving more architectural character to the interior of the building than is realised in average houses of the usual type.

Valuable suggestions on this subject, as well as on practical points, may be obtained from Mr. Daly's second volume, before mentioned, which is worth the special study of all who may have to deal with this architectural problem, which seems not unlikely to be brought presently, more or less, under our immediate experience; and if the "House in Flats" offer the architect less scope for the refinements of his profession than the private house, no class of building, we venture to say, is calculated to bring out better the radical distinction, which the French well know, but which the English public and their literary oracles seem unable to perceive, between the architect and the speculating builder.

THE PROGRESS OF SANITARY ARRANGEMENTS.

THE Fourth Annual Report of the Local Government Board comprises the three distinct subjects of the administration of the laws for the relief of the poor, local government, and the public health. The administration of the Sanitary Acts, instead of coming under the third of these heads, is grouped under the second, together with the administration of local government for all other objects. By this arrangement the Report fails to bring the sanitary movement of the year into that full relief which the importance of the subject demands. We append a few notes on some of the principal items of the Report.

The total expenditure of the past year that is included under the title "Local Taxation" amounts to 32¾ millions sterling. Of this sum only 23 millions have been raised by direct imposts; the remainder, amounting to 9,872,145*l.*, having been derived from "other sources of revenue, including loans."

Out of this sum, it appears from the tables included in the Report, rather less than 3½ millions has been devoted to sanitary purposes. The exact figures are,—"Total expenditure, urban sanitary rates, 6,416,822*l.*; and rural sanitary rates, 23,540*l.*"

Of the total amount of 6,440,362*l.* thus expended, however, only 3,117,791*l.* have been levied by local taxation. The difference, together with the unexpended sum of 172,831*l.* (which appears to be in the hands of the urban sanitary authorities) presumably represents loan, or at least indebtedness. Thus the sanitary expenditure forms only about one-tenth part of that expenditure of local taxation of which the Local Government Board takes cognisance. The figures tabulated in the appendix (p. 462) do not exactly tally with those which we have here taken from the body of the Report (p. liv.). They give the sum of 5,355,724*l.* as expended by urban sanitary authorities, and that of 23,540*l.* as "contributions to rural sanitary authorities." The numbers of the population in behalf of whom these expenditures have been made are not given in the tabular return.

It will be remembered that the expenditure thus incurred has to cover the two distinct items of outlay on public works, and annual charges. We do not find these payments distinguished in the Report. Thus while it may appear at first sight as if the sanitary expenditure of 5,379,264*l.* bore a high ratio to the sum of 8,480,819*l.* expended in the relief of the poor, the case is altered when we remember that the latter includes only the current charges of the year. The Report, therefore, does not allow us to distinguish between the capital sunk in sanitary works, and the sum spent in the current expenditure of the year.

If we turn to the latest official authority that can throw light on the subject, namely, the return to the order of the House of Commons, No. 134, for the year 1873, we find that 109 sanitary authorities had expended in permanent works, including land, just twenty-five times as much as their annual outlay. If this proportion should hold good (which can only be matter of guess until returns are completed to a later date), the annual outlay incurred by sanitary authorities in the past year will have been about 214,000*l.*, and the sum invested in works about 5,165,000*l.*

The purposes to which the receipts of the local authorities have been applied are ranged by the Report under seven general heads. They are as follow:—

1. Protection of life and property	£3,903,241
2. Public health and convenience	10,741,470
3. Land and sea communications	8,663,572
4. Preservation of lands	247,552
5. Relief of the poor.....	8,480,819
6. Education and religion.....	235,166
7. Miscellaneous	393,135

The minor details that are comprised under these heads, and which amount to a total sum of 32,664,955*l.*, are given in the appendix to the Report.

The indebtedness of the local authorities is a subject of no little importance. The rapidity with which this burden is increasing is matter for watchful anxiety. In 1873-74 seven distinct groups of local authorities had borrowed the aggregate sum of 54,548,625*l.* Mr. Purdy, the principal of the Statistical Department, estimates that "the total indebtedness of the local authorities in England in respect of loans in 1873-74-75, or thereabouts," will be 83,062,000*l.* The smaller sum is made up as follows:—

1. Poor-law authorities	£4,829,100
2. Urban sanitary ditto	6,030,297
3. Metropolitan local management ditto	16,230,128
4. Drainage and Embankment ditto.....	1,562,672
5. Burial Board.....	2,304,551
6. Harbour authorities	20,440,593
7. School Board.....	3,548,625
	£54,548,625

Of this sum 6,739,302*l.* have been advanced by the Public Works Loan Commissioners; 16,001,084*l.* by insurance and trading companies; and 31,808,239*l.* have been obtained from other sources, chiefly private persons. The rates of interest vary from 3 to 5 per cent.; the bulk of the sum paying from 4 to 4½ per cent. It thus appears that the local taxation is already weighted with upwards of two millions and a quarter per annum by way of interest on loans contracted by the local authorities. Thus, while the local budget is rapidly advancing to a magnitude of nearly half the national budget, the local debt is as yet far from bearing the same proportion to the national funded debts. But it bids fair to increase with rapidity.

It is thus clear that the operation of the sanitary authorities throughout the country is regarded, not as a distinct head of the duties of the Local Government Board, but as one of seven distinct branches of local administration, over which only a very general supervision is exercised by that branch of the Government. This, no doubt, is in accordance with the actual condition of the law on the subject; but none the less is it a result anything but re-assuring. We have already called attention to the Reports of the Local Government Board inspectors printed on the 7th of April last. These papers hardly bear out the satisfaction expressed in the present Report as to the "general activity shown by the several urban and rural sanitary authorities in discharging the important duties devolving upon them." We are willing to hope that the Local Government Board have a sounder basis for this satisfaction than they have as yet made public. But when we see that they have actually descended to the summation of the number of nuisances reported and abated during the last year, as well as of the structural works undertaken by the various authorities during that period, we certainly find something that may be called gratitude for small mercies.

The Local Government Board appear to have done excellent service during the past year in calling the attention of Parliament to undesirable provisions or omissions in thirty private Bills deposited by local sanitary authorities. Nevertheless, it is very obvious that much time, trouble, and cost would have been spared if the advice of the Local Government Board had been sought in the first instance as to the drafting of these Bills. This is another example of the great loss of administrative power occasioned by the absence of organisation in the sanitary machinery; and this is the more striking when we find that the Report draws attention to the "number of local Acts already in force, the provisions of which have required to be carefully regarded in considering the effect of the proposed new enactments."

A select Committee of the House of Commons having recommended the repeal of the Acts relating to the adulteration of food, and the substitution of an amended Act, the Board have suspended any compulsory action as to the appointment of analysts. One hundred and twelve local authorities have now complied with the existing provisions of the law in this matter.

A review of the entire report of the Local Government Board appears to show the exercise of a vigilant care for the welfare of the country, fettered and hampered to a great extent by the influence of the Act of 1872. The provisions of this measure have directly interposed to prevent a definite and systematic appreciation of the sanitary engineering required for the well-being of the country. Thus the outcome of local action is reduced to such a degree as to allow of the enumeration of reports of individual nuisances, by way of measure of activity.

A New Roman Catholic Church for Kilburn. — A new Roman Catholic Church will shortly be begun at Kilburn by the Oblates of Mary Immaculate. The architects are Messrs. Pugin.

FRENCH AND AUSTRIAN BRICKS.

IN conjunction with M. Thévenet's criticism on French and Austrian joiners, which we have already noticed in these columns, Messrs. A. Morel & Co., of Paris, published a similar pamphlet on brick-making and building by M. Alexis Fannier. The style of this little work is more refined than usual in pamphlets of this description; and, though the author, as a simple working man, complains bitterly that his education has been so neglected that he is scarcely able to accomplish his task, he nevertheless gives a very graphic and interesting description of his journey to Austria. The sight in that country of women working with masons naturally created the greatest surprise in the Frenchman's mind. Though the work is undoubtedly dangerous and rough, young women and girls may be seen at Vienna ascending and descending high scaffolding to carry bricks, mortar, &c., to the masons who are at work on the summit. These men and women are not Germans, however, but come, for the most part, from Hungary or Bohemia. M. Fannier, of course, protests in energetic terms against the employment of female labour in the craft. The sight of women, bare-footed and with short skirts, struggling up ladders with burdens of bricks on their shoulders does not suggest an advanced state of civilisation, nor is it conducive to that sentiment of delicacy and modesty which is the special attribute of woman. Their feet also, constantly chapped by the action of lime on which they are frequently treading, soon become covered with sores, and the exposure to all weathers aggravates the suffering to such an extent that paralysis sometimes ensues. For the larger buildings, however, the bricks, &c., are hoisted up by a chain affixed to a winch or capstan. The scaffoldings,—and this is a point worthy of note,—are pronounced preferable to the constructions on which the Parisian mason is compelled to work. This is an important admission, coming from the month of a Frenchman, for our neighbours have often been stated to excel in this special phase of building. The accidents, however, which nevertheless frequently occur in France in consequence of the faulty organisation of scaffolds, are very rare in Austria. Before a building is commenced, a large number of pine-poles are planted very close to each other; in fact, the total number required for the scaffolding is put down at once. The cross-pieces are then carefully bolted, and the planks are not merely laid between, but they are nailed down so as to render them quite secure. On the outside, from pole to pole, a piece of wood is also nailed, which acts as a sort of balustrade, so that it would be difficult for a workman to fall off, even if he tried to do so.

Vienna is now undergoing a series of improvements destined to maintain its renown as one of the most splendid capitals of Europe; and new streets are consequently pierced through old quarters, trees planted to shade boulevards, and magnificent mansions reared under the direction of architects well versed in all phases of modern improvements. A great number of these constructions are made with bricks and lime-mortar. This mortar is very clear, so that buckets are used instead of the ordinary hoes, and these are filled with large round spoons holding three or four pints. The masons employ a smaller but similar spoon, with which they pour the mortar over each row of bricks, and the substance being limpid runs down the joints, or spaces left open between each brick, of its own accord. The mortar, however, does not merely fill the spaces left open for its reception, but spreads itself all over the bricks, giving them an untidy and unfinished appearance. When, therefore, the work is completed, this has to be scraped off; then the walls are coated with a light yellow cement, which answers as an imitation of stone.

The bricks used for baking-ovens, factory-chimneys, and constructions destined to hold boilers and machinery, are the subject of special study. We have the description of numerous baking-ovens, and are assured that Vienna bread is irreproachable both as to its colour and the regularity with which it is baked. The Vienna ovens bake bread at a smaller outlay of fuel, but the large loaves sold in France could not be cooked in them. On the other hand, it is scarcely expedient to make such large loaves, for they require an intense heat, and this generally dries the outer crust while it leaves the interior in too moist a condition. If less heat is used, the bread would have to remain too long in the oven, and the crust would be pale and dry, and devoid of proper moisture. The French ovens are generally made of bricks. They are not covered over, as in Vienna, with sheet-iron, and it is urged that the bricks retain humidity even when the driest wood is used. The steam from the wood and the dough ascends and enters the pores of the bricks, and then, as the heat gradually subsides, and the baking progresses, this vapour falls again on the bread. Thus the large loaves obtain the colour and retain the moisture and weight they would have lost in an iron-plated oven, as the metal burns instead of preserving the humidity. Red bricks, measuring 32 centimetres in length, are generally used for the external covering of Austrian ovens. Those used for boilers and chimneys are of the same length. In width they measure 12 to 14 centimètres, and 6 to 8 centimètres in thickness; their colour is of a pale red. They are badly made, the clay is not properly sorted, and consequently contains numerous foreign bodies, and notably limestones. The kneading is done by hand, the work being performed very irregularly, and the stones that remain in the clay often break when submitted to heat, while the subsequent effect of damp causes the bricks to crack, thus destroying the appearance of the building in which they have been employed. Their shape also is awkward, so that, altogether, chimneys and ovens constructed at Vienna cannot be taken as examples of good brickwork. The French bricks, which invariably measure 22 centimètres in length, 10 centimètres in width, and 5½ centimètres in thickness, can be held in one hand, and are therefore easily manipulated by the mason; whereas the Austrian brick must be held by both hands, and this occasions a serious loss of time. The quality of the Vienna brick might be greatly improved if the red clay with which they are made was mixed with a small quantity of the green clay found in the neighbourhood of the Palace of Schoenbrunn, and which is now used only for pottery, statuettes, and terra-cotta ornaments.

Formerly the bricks used in France were manufactured in the Northern departments or in Belgium, but this industry has now extended to many other districts; for the economy realised by the use of bricks is more universally appreciated. Thus a great number are now made in the neighbourhood of Paris, though the Paris clay does not blend easily, but it is, nevertheless, sufficiently good not to require mixing with other clays. Various methods prevail for the manufacture of these bricks, though the use of a pressing-machine is most effective and most popular. The clay is reduced to small pieces with a pickaxe and then placed in the moulds by means of a shovel. Each press contains two metal moulds, so close to each other that they may be filled at once from the same shovel of clay. This done, a workman presses on the lever, and, as he releases his hold, a rod, placed in opposition to the lever, forces the clay up and out of the mould. The workmen may then seize the clay which has thus assumed the shape of a brick, and place it on a wheel-barrow ready to be conveyed to the drying-room. Other manufacturers prefer to wet the clay, so that it can be manipulated and kneaded by treading. The workmen, however, thus employed find it most difficult to make a sufficient number of bricks to earn a good day's wages. In some other brick-fields the clay is kneaded by machines which a horse sets in motion, while there are not a few workers who content themselves by simply using a spade. The moulding-machines of Belgium and the North of France produce two bricks at a time, and from 5,000 to 6,000 per day. A young man and a young woman together suffice to work and feed them. With regard to baking, every system has its partisans; but it may be said that the wood fires are more easily managed and produce the best bricks.

There is a great quantity of green clay in the neighbourhood of Paris; but it has to be treated in a peculiar manner in consequence of its greasy and tough nature. It is dried in the sun, then broken into pieces about the size of nuts and mixed with sand and coke-dust. This latter substance not only thins the clay, but facilitates the baking. Formerly the clay was exposed to the action of the frost as well as the sun before it was broken up; but now, apart from these two rival and natural processes, an artificial cutting-machine has been introduced which can be moved by steam or by a horse. When the clay has been duly cut or broken, it is thrown into a kneading-pit made of bricks, which are previously covered with cement so that water may not escape. In the potteries the clay is spread out in layers about 12 to 15 centimètres thick, and kneaded with the feet, a process which is termed in France *marcher la terre aux pieds*. For whatever purpose the clay is required, it is generally rolled into pieces weighing from 40 lb. to 50 lb. after it has been withdrawn from the kneading-trough, and left standing for several days, so that the humidity, if not evenly distributed, may have time to spread itself over the whole in equal proportions.

The ovens for baking the bricks are constructed after various models, but the ordinary Paris oven contains an open space of 70 cubic mètres, in which 35,000 bricks can be placed. It is, therefore, estimated that 500 bricks can be packed for baking in a cubic mètre. The fire is in some cases situated by the front wall, and in others it goes right through the oven. The latter is more easily managed, but also more expensive. The greatest experience and tact are necessary to know exactly when the bricks have been baked long enough to attain a sufficient degree of heat, and then it is no easy matter to extinguish the fire without letting the smallest volume of cold air enter the oven. Should such an accident occur, the transition from extreme heat to cold would probably cause a great number of bricks to crack. Apart from the ordinary green clay, there are near Paris the celebrated clays of Vaugirard and Vannes, which are very useful for household pottery and for cooking utensils.

The best fireproof clay of France is found in the neighbourhood of Arras. It is rather dark, soft, and very compact. At Antragne, near Quiévrain, on the road to Valenciennes, there is also some clay of this description, but not of so good a quality. The clays of Forges and neighbourhood are much superior, and are extensively used for reflecting heat, for stoves, &c., but they are very dear, and must be dug up from a depth of 50 ft. to 60 ft. To obtain the purest clay for the purpose of resisting heat, it would be well to dissolve the clay in water. As the tub in which this mixture is made becomes too full, the surplus clay and water should be allowed to run off by means of a pipe to another tub situated a little lower; and so on from tub to tub, till five or six tubs are full of clay water. As the ferruginous and other foreign bodies, which cause bricks to split, weigh heavier than the clay, they would sink to the bottom, and only the lightest and best clay could float down with the water to the tubs situated on the lower level; the last tub thus containing the best clay. With time it would settle at the bottom, and the water can then be removed by tapping the tub just above the level of the clay.

In conclusion, we may gather from the remarks of an artisan, whose practical knowledge and experience have won the high consideration of his fellow workmen, that the French produce superior bricks, while the Austrians are more careful in the construction of scaffolds. These at least are two facts worthy of record, and our only regret is that English artisans seldom find the means to travel, and publish their practical criticisms and experience.

PRIMITIVE HOUSE-BUILDING AND ARCHITECTURE.

IN the war of styles, and in the eagerness for new and improved methods of construction, and it must needs be added, in days essentially of cheap house building, it may be of interest to glance for a moment at the habitations of less civilised and less fortunate communities than our own. House-building necessarily differs in different climates, in different countries, involving different materials and modes of putting materials together. It would be difficult to overrate the importance of such a subject as this, for the modern proclivity to uniformity in all things, both material and mental, and the perpetual spread of a uniform "civilisation," as it is termed, tend, as a matter of course, to equalise and render uniform in all ways possible the houses and dwellings everywhere under its influence. Hence it is that we see the same type of house and villa building in all our colonies. The outskirts of Australian towns, such as Melbourne, might be taken, at a first glance, for those of suburban London. A New Zealand town differs but little, if at all, from one in the United States or Canada. Special opportunities are abundant of noting this. It is the same all the world over where "Western" influences have made any progress or headway at all. Calcutta and Bombay have streets of modernised houses, and even palaces, which

might be brought by art of magic to London without fear of their place of birth being found out, so like are they to all things about us here. Improved Constantinople, too, is coming to this, though, as it would seem, somewhat slowly. It must needs be of interest, therefore, to glance occasionally at the *old* ways of house-building, now so fast disappearing all the world over.

For the first *primitive* example of house building, and sufficiently primitive and original it certainly is, we need to travel to the extreme north, where things are yet to be found in a state of primeval barbarism, or naturalism, as it may more correctly be termed. The Siberian "*yourt*," or tent, in which the natives, the wandering Koraks, live, and move (as far as is possible), and have their being, is indeed a curiosity in the way of house-building. We have little original information about it. Contrivance, according to circumstances and conditions of life, is not confined to the civilised man. The climate in which these human beings, for they are human, live, is so keen and fierce that no ordinary house-building would be possible, even if materials were at hand for it, the thermometer in winter, as often as not, going down to 50° below zero. House-building there must therefore be a speciality and a curiosity, and it certainly is both the one and the other. A "yourt" is a rude construction of drift wood, as thrown up by the sea. It is about 20 ft. high. It has, strange to tell, neither door nor window of any sort. It is to be entered only by aid of a notched pole which takes the owner to the roof, and to the circular hole in the top of it out of which the smoke from the fire inside comes. Another notched pole is here fixed into the ground inside the hut, or house, and reaching to the roof: this constitutes the "stairs" by which entrance is effected—a right primitive staircase, a traditional record, we may suppose, of our remote ancestor, the "stone-age" man, about whom the geologists are so anxious and curious, and not a little puzzled, just now. For most part of the year this primeval house is covered thickly with snow. But if the exterior of it is a singularity, most surely not less so is its interior. This interior receives its light only from the round hole which serves alike for entrance-door and chimney. In colour it might have satisfied even Rembrandt himself, for the beams, rafters, and "drift" of which it is built up, are all of a glossy blackness from the smoke in which they are always enveloped. Round the floor or ground of this dwelling there is a wooden platform, raised about 1 ft. from the ground, reaching from the walls and about 6 ft. wide, thus leaving a space in the middle of the yourt of about 10 ft. in diameter. In this open spot is the fire, and over it always a huge copper kettle of melting snow. This platform takes up about three-quarters of the room. On this raised platform, which serves also as a settle round the perpetually burning fire, are the bedrooms, called "pologs." These are formed of the heaviest furs that can be procured; they are sewn carefully together to exclude the air. These "rooms" are lighted, and at the same time warmed, by a fragment of ignited moss floating in a wooden bowl of oil. They are about 4 ft. in height, and 6 ft. or 8 ft. in width and length. The temperature of these primitive dwellings but seldom ranges above 20° or 25°, consequent on the intensity of the outer cold, though the fire raised on its circle of rough stones is always burning. It needs but a dull imagination to picture the effect of the constant smoke. The lower part of the yourt is comparatively clear, but the upper part is filled by the dense moving cloud of dull vaporous mist. Our informant lived in a "yourt" for some time, and gradually got used to it, and boasted, as a proof of vigorous health, that he could "eat anything." May it not be that the healthiness of a Korak yourt, in spite of all, is owing to the fact of the keenness and purity of the outer air, which must needs find its way in at all times? And such purity of air, be it noted, is before all else needed, and makes up for nearly all other shortcomings and deficiencies. All things at first glance seem to be out of proper order here, but they are fitted for the place and climate, and circumstances of those who live in the country where they obtain. And be it observed, in passing, that bad as they may look from our point of view, they are not a whit worse than some of the "huts" that we have seen, in which our hardworking and industrious coalminers live and rest themselves. There are many other matters in this cold north, well worth the noting, and some good might come of their being attended to and well thought over. One of them we may mention as especially noteworthy. It is that the keen cold of an extreme northern climate, though so keen and fierce, many degrees below zero, does not strike, when the air is still, so cold, as the raw, damp atmosphere does here. "There are mysteries in cold, and air, and vapour, not yet come at by the scientific," says one of our Arctic voyagers,—and who can doubt it?

If the huts or dwellings in the wild wastes of the north are thus curious and strange, and unlike anything here in our civilised surroundings to be seen, not less so are the villages or towns where the houses are congregated together and are more permanently built; indeed, we may here find the incipient beginnings of streets and towns. Streets, in one sense of the word, there are none, not even roads, or pathways. The houses or huts are built all about, at random, just where the fancy of the builder and owner may happen to place them. They front all ways, if, indeed, they can be said to have a street front at all. A house of some sort is even a primitive necessity, but a street would seem to be a matter for an advanced state of society. It is a point worth noting. Their better sort of dwellings, thus congregated together, and in as cold a climate, are quite habitable and comfortable abodes. They are not of "drift" wood, like the primitive "yourt," but are constructed of rough logs of timber, with the bark left, wisely and artistically, on it, on the outside, the inner side being scraped and brightly polished. The low doorway rough enough, and the window not of glass, but of transparent skin. The fireplace with universal "settle," in place of movable chairs, is well fitted for its purpose, and the house thus built stands where a modern-built house, fresh from a new town here, would not endure for a week. The primitive yourt, be it noticed, is a movable structure,—this is not, and it may serve to instance how the fixed habitation grows out of the earlier and movable one. There is no "style" of architecture here, but the picturesque, if not the "architecturesque," finds a place of necessity in houses and dwellings like these.

We may pass from these snow-covered abodes to the far North to Eastern dwellings, where the hot sun has well-nigh all his own way. The houses of the native races in the less-frequented parts of India are quite as remarkable as those we have named, though in a different way. They are simple enough, and consist, for the most part, but of a single room. There is no window, all the light coming in from the doorway, a little of so intense a sunshine as here sufficing. The walls are for the most part of mud, a reddish clay, mixed with small fragments of quartz and granite to bind it together and harden it. It lasts many years, and is found to resist the heaviest rains. So good is it, we are told, that in many of the towns and villages these houses have flat roofs terraced with this substance, and it is found to be watertight. These walls are painted on the outside in alternate vertical stripes. If, says an observant traveller, these huts had but windows, they would be comfortable enough. There is here no "furniture," in our sense of the word. The floor is covered with rushes, and a rug with pillow for reclining, after the Eastern man's fashion. There may be a shelf or two, and a painted chest. In some places—for these primitive dwellings differ in different parts of India—there is a second hut for sleeping in, and perhaps another for a storehouse. Nothing can be more quaint and out of the way than the aspect of some of these Hindoo "villages," or groupings of huts or cottages. They seem to creep up the sides of hills, and to vie with the trees themselves in irregularity and thickness of clustering. In the hunt after "ruins," and the remains of the great temple architecture, it is a pity that so little has been done in the making record of this simple poor house building. It is surely a mistake, for very much of the temple work itself comes originally from the common hut and domestic house building. We are not here speaking of city house-building, but of the work to be found in the more primitive villages, wherein the materials at hand, and the necessities of the case, and the ingenuity of the untutored inhabitants, form the items of the problem. It is in rude structures like these that house, if not temple and palace, architecture begins. We may, in passing, notice a curious instance of this in a walled town. A house of this character is built on the top of the wide earthen wall, and immediately over the entrance-gateway to the town, and it makes of the simple round arch opening quite an architectural feature. It is a fortified gate, and a most ingenious one, showing how, indeed, architecture may grow out of necessity and bare "construction."

All over the vast continent of India the village house or hut building is in principle of this kind, and the contrast between it and that of the dwellings of the cold North is sufficiently noteworthy. Of architecture, as that word is commonly understood, there is none; but the "picturesque" is most surely common to both orders of building. May not our Polar Expedition explorers meet with something new in this way? And most surely if India were but slightly searched, very much would be found that would amply repay that search. Architecture as it now is, over Europe, is in a sufficiently artificial state, and the time must come when a peep into its origin may be useful and necessary. There are many things but little known to be yet met with, besides those we have here glanced at.

GLASGOW NEW STOCK EXCHANGE.

THE handsome building now in course of erection in Buchanan-street by the members of the Glasgow Stock Exchange, is gradually approaching completion, and it is expected that it will be ready for partial occupation by the coming spring. The new erection is in the Gothic style, and large figures, symbolic of trade and commerce, and which are placed in niches on the front, contribute much to the general effect. The area occupied at the corner of West George-street and Buchanan-street is 85 ft. in length by 74 ft. in breadth, and the new building will be three stories in height. The principal entrance will be in Buchanan-street, next door to the Western Club, and over this is a tower rising to a height of 112 ft. The chief apartments are located on the first floor, to which access is gained by a flight of stairs leading from a spacious vestibule about 15 ft. square. Fronting Buchanan-street is the Exchange-room proper, where the members will assemble for the transactions of their ordinary business, and the dimensions of which are 60 ft. long by 50 ft. in breadth, with a height of 32 ft., thus affording almost double the accommodation at the existing Exchange. The new room will be furnished and appointed in convenient and suitable style. At the rear of this, on the same floor, will be the reading-room, an apartment 41 ft. by 19 ft., while to the south of this, and nearest the Western Club, will be retiring-rooms and accommodation for holding committee meetings. At the front of the building, but on the second floor, will be the telegraph-office, 50 ft. long by 16 ft. broad, with the requisite message-rooms attached; while the clearing-house department will consist of a large room in the rear, the dimensions of which are 63 ft. by 50 ft., lighted from the roof by means of a large glass dome. On the same story will be the secretary's offices, clerks' rooms, and retiring apartments. The estimated cost of the building is 20,000*l.*, in addition to 25,000*l.*, the cost of the site, the expense of which may be readily accounted for by its commanding position in the most fashionable street in Glasgow, and its close proximity to the Royal Exchange and other centres of the more important commercial operations.

Mr. Jas. Thomson (Baird & Thomson) is the architect.

STIR AT THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE following resolutions, we are requested to say, will be proposed at the meeting of the Institute to be held on Monday next, on behalf of certain Fellows and Associates connected with the Architectural Association:—

"I. That the proposal to introduce among the students of the R.I.B.A. powers similar to those suggested in Appendix 7, as a scheme of amalgamation to the Architectural Association, could hardly fail, if put into practical operation, to disturb the good understanding and satisfactory relationship which has for many years subsisted between the two bodies.

II. That the introduction into the class of Associates of persons not being members of the profession be not approved.

III. That the proposed alterations in the conditions of membership do not commend themselves to this meeting.

IV. That opportunity should be given at each general meeting to the members to ask questions concerning the direction and management of the Institute, to offer suggestions, and to propose resolutions thereon. At meetings at which papers are to be read, questions found to involve lengthened discussion to be deferred to opportunities arranged for their discussion by the Council. That the first part of by-law No. 48 be repealed, it being practically at variance with the provisions of the Charter.

V. That members desirous of associating themselves together for the promotion of any object calculated 'to advance civil architecture, to promote or facilitate the

acquirement of the knowledge of any art or science connected therewith,' or to advance the interests of the profession, shall be empowered so to do; and to frame their own regulations, which shall set forth the objects of such association. These regulations shall be submitted to the Council, and on their being sanctioned by it, rooms for meetings, publication of notices, and such other facilities as may be practicable, shall be afforded to the said associations, who shall be bound, at a general meeting of the Institute in each year, to present a report of their proceedings."

*** As already stated, we do not find ourselves in a position to discuss the report of the committee. We are forced, however, to say that we dissent entirely from its main recommendations, and trust that the meeting will come to an unmistakable vote in that direction on Monday,—always remembering the thankfulness due to a committee who have given much time to the consideration of a difficult subject.

SIR,—Having been called upon in the absence of Professor Donaldson to take the chair at some meetings of the committee on the affairs of the Institute, I have been requested by several of my colleagues on that committee to allude to a letter from that gentleman which appeared in the professional papers on Saturday last, and to request the Fellows of the Institute to suspend their judgment upon the report issued by that committee until it can be calmly discussed on all its bearings in the meeting-room of the Institute. We think it much to be regretted that the Professor had not contented himself with the protest he had already thought it necessary to make, and which has been printed and issued with the report to every Fellow of the Institute.

I need now only remind those members of our profession who are really interested in the consideration of this report, that the committee consists of twelve members of the Institute (eight being Fellows and four Associates), who were, in virtue of a resolution passed at a general meeting of the body, nominated by the Council, and may, I think, be fairly considered as representative men of their various grades; of this number *eleven* are unanimous in signing the report and endorsing its recommendations; one dissents and protests under thirteen heads. Can it be believed that these eleven architects are so indifferent to the honour and status of that profession by which they are living as deliberately to urge the adoption of rules and regulations likely to dishonour their position, or which, as Professor Donaldson considers, would "degrade the profession and drive every honourable man who respects his own personal character and the prestige of his profession to keep aloof from such a mongrel combination"?

The committee may have erred in judgment, but can hardly be supposed deliberately to have committed the suicidal act attributed to them by Professor Donaldson.

THOMAS HENRY WYATT,
Past Pr., R.I.B.A.

THE LATE MR. JOHN TARRING, ARCHITECT.

THE career of the late Mr. Tarring, who died at St. Audires, Torquay, on the 27th ult., aged 70, affords an interesting and useful example of what may be done, even under disadvantages, by industry and perseverance. Mr. Tarring was born at Holbeton, near Plymouth, Devon, and until he came to London worked as a carpenter or plasterer, or probably employed himself in the kindred manual occupations that a capable young man finds opportunity to turn himself to in a country village. He came up to London in May, 1828, and almost immediately put himself under the instructions of Mr. Brown, architect and surveyor, of Wells-street, Oxford-street, at the same time, we believe, attending a large builder's yard in Paddington. He afterwards bought of Mr. Brown a drawing academy that he had kept; and records of his studies and successes may be found at the Royal Institute of British Architects, of which he in 1845 became a Fellow. In earlier days he had obtained the Royal Academy's silver medal for measured drawings. We are told by one of his oldest friends that his practice increased steadily from the time that he established himself in his profession. He was employed by the late Earl of Combermere to restore Combermere Abbey; and he carried out extensive alterations and restorations at Thornton Hall, Bucks, the seat of the Hon. Richard Cavendish.

Mr. Tarring made suggestions, and submitted plans to the Government for concentrating the Government offices in one block of buildings on the site, or nearly so, occupied by the new buildings fronting Parliament-street, particulars of which were given in the *Builder*. In the competition that ensued he sent fresh designs, which were well spoken of by the press.

For some years his youngest son has been in partnership with him.

The following is a list of his works, though probably not a complete one:—Akeley Church, Bucks; Bethnal-green Chapel,—the first Dissenting place of worship built in London with a spire; Bedford New-town Chapel; Portland New-town Chapel; Old Westminster Chapel; Peckham-rye Chapel; Falcon-square Chapel; Horbury Chapel; Vine's Church, Rochester; Clapham Congregational Church; Presbyterian Church, Cork, Ireland; Tolmers-square, Congregational Church; Huntingdon Union Church; St. Ives, Hunts, Union Church; Baptist Church, Victoria-road, Leicester; Luton Congregational Church, Bedfordshire; Wesleyan Chapel, St. John's-hill, Wandsworth; Wesleyan Church, Mostyn-road, Brixton; Wesleyan Church, Malvern; Wesleyan Church, Clapton; Congregational Church, Lewisham; Presbyterian Church, Lewisham; Congregational Church, Southernhay, Exeter; Stamford-hill Congregational Church; Congregational Church, Chapel-street, Blackburn; Tavistock Congregational Church and Schools; Presbyterian Church, Upper George-street, Edgeware-road (Dr. Donald Fraser); Christ Church, Chase Side, Enfield; residences of the late Mr. J. Chubb, Mr. G. K. Chubb; Mr. J. E. Vunner, Mr. Owen Edwards, Mr. J. Webster, and others, at Chislehurst, Kent; Tingewick Rectory, Bucks; Tromer Lodge, Down, Kent; houses at Queen's Gate, Kensington; restorations and alterations at Coedgwgen Hall, Glamorganshire; Combermere Abbey; Thornton Hall, Bucks; Wykham Park, Banbury; Springfield, Banbury; also altering and remodelling Whitfield Chapel, Tottenham-court-road; the Congregational Memorial Hall, Farringdon-street; Messrs. Filmer & Son's shops and warehouses, Berners-street, Oxford-street; Messrs. Parkinson's Gas-meter Manufactory, Cottage-lane, City-road; and the City Bank, Ludgate-hill Branch. The last was recently illustrated in our pages, as was also, on a former occasion, the Memorial Hall.

REPAIRS OF CHIMNEY-SHAFTS DAMAGED DURING THE SIEGE OF PARIS.

A RECENT number of the *Annales du Génie Civil* states that during the war of 1870-71, a large number of chimney-shafts in Paris and the neighbourhood were injured by the fire of the German artillery. Some were razed to the earth; others were battered down more or less completely; whilst others, again, remained standing, but were pierced with shot-holes. Nearly all have now been repaired. Indeed, the work of restoration may be said to be completed. New shafts have been built on the plans of those demolished. Here nothing more was requisite than to clear away the ruins before rebuilding. But the pierced shafts were much more troublesome to deal with. The breaches in them varied from 18 in. to 7 ft. in height, and averaged 18 in. across. In such cases it was unsafe to meddle with the shaft until it had been strengthened. Timber shores were, therefore, placed vertically in the holes, and the openings then were built up with bricks set in plaster, which has the property of setting very quickly. This done, the shafts were taken down from the top, in the usual manner, and entirely rebuilt.

LONDON BRIDGE IMPROVEMENT.

OF the numerous schemes proposed for affording additional traffic accommodation over London Bridge, only one, as yet, is to be brought before Parliament in a petition for the conversion of a private Bill into an Act. A Bill has been deposited, wherein it is proposed to incorporate the London and Southwark Arcade Bridges Company, to authorise them to make two new bridges, from the foot of London Bridge at the south end thereof, to the north end of the same bridge, and for other purposes. The preamble sets forth that it would be of great public utility if two bridges, one on the east and the other on the west side of London Bridge were made, for the diversion of the passenger traffic at present passing over London Bridge; and that certain persons are willing, if incorporated into a company, at their own expense to undertake the erection and maintenance of the said bridges. The proposed capital is 160,000*l*., divided into 16,000 shares of 10*l*. each, with the usual borrowing powers. The works proposed to be executed are two bridges, one on each side of London Bridge, each commencing in the parish of St. Magnus, in the City of London, at the top of the steps leading down to the river Thames, and, crossing the river, terminating in the parish of St. Saviour on the Surrey side at the top of the steps leading down to the river. The company may dedicate to the public as a footway a space not less than 15 ft. in width on the inner sides of each bridge, and may erect upon the remaining portion of the two bridges, to abut upon the footways, buildings and shops, which the company may lease, sell, or dispose of at or for such considerations and upon such terms as they think fit. The Bill provides that the company "may levy tolls, rates, rents, and duties, in respect of the use of the bridges," &c. The promoters seem to be unconscious of the fact that a characteristic of the present time is the abolition, not the imposition, of metropolitan bridge tolls, and their proposal, if it applies to foot passengers using the footways formerly mentioned, is made quite too late in the day. The estimated cost of the works is 150,000*l*. Mr. George W. Usill is the engineer.

PROPOSED SEPARATION OF BATTERSEA FROM THE WANDSWORTH DISTRICT BOARD OF WORKS.

THE inhabitants of Battersea are taking steps for the separation of their district from the Wandsworth District Board of Works, and forming it into an independent vestry, and at a special meeting of the vestry, held last week, at which the Rev. J. Erskine Clarke, vicar of Battersea, presided, a memorial to the Metropolitan Board of Works was adopted, asking the Board to promote a Bill for the amendment of the Metropolis Local Management Act, by which the separation could be carried out. The memorial states that since the passing of the Act the parish of Battersea has greatly increased in rateable value, population, and inhabited houses, and that a great increase is still taking place. In 1851 the population was 10,500, and the rateable value 57,472*l*. In 1861 the population had increased to 19,600, and the rateable value to 92,090*l*. In 1871 the population was found to have nearly trebled itself during the preceding ten years, being at the last census 54,000, with a rateable value of 226,121*l*.; whilst at the present time the population is estimated to be between 70,000 and 80,000, and the rateable value has increased to 333,935*l*.

THE LANTERN OF ELY CATHEDRAL.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT an ordinary general meeting of the Institute, held on Monday evening last at Conduit-street the President (Sir G. G. Scott) in the chair, the following gentlemen were elected members:—As Fellows.—Mr. F. E. H. Fowler, of Serjeants' Inn, Fleet-street; Mr. J. Douglass Mathews, of Cloak-lane, E.C.; Mr. John Middleton, of Cheltenham; and Mr. John Noyes, of Clarges-street, Mayfair. As Associates.—Mr. James Jerman, of Exeter; Mr. J. H. Oswald Brown, of Piccadilly; and Mr. Frederic Hammond, Lilford-road, Stoke Newington.

The Secretary announced the decease of the following members:—Mr. John Tarring, Fellow, and Mr. Albert Bridgman, Associate.

Mr. R. Reynolds Rowe, Fellow, then read a paper "On the Lantern of Ely Cathedral." After giving a brief historical sketch of the building, beginning with the monastery founded by Queen Etheldreda in the seventh century, Mr. Rowe proceeded to describe the Octagon at Ely. It was in 1322 that the central tower fell, the accident being attributable to weakness of construction and defective foundation. Alan de Walsingham having cleared away the *débris*, raised his octagonal tower upon eight pillars, which had their foundation on the solid rock below. The masonry of this octagon having been constructed with great care, is at this day perfectly free from settlement. The stone used was oolitic, obtained from quarries in Northamptonshire. The octagon is regular, but unequal-sided. Each of the four cardinal sides, next the nave, choir, and transepts, measures 40 ft., and each of the diagonal sides 27 ft. Each diagonal side is pierced by an arch, 11 ft. 4 in. in span, and higher up by a four-light window. On each diagonal side between the point of the arch and the window-sill are three shallow niches, with

bold corbels, upon which are placed seated figures of the Twelve Apostles, the hood-mould terminations of the niches representing the heads of the sixteen major and minor prophets of the Old Testament. Attached to each pillar of the octagon is a shafted empty canopied niche, of great beauty, resting upon a corbel sculptured in illustration of the life of St. Etheldreda. Externally, Alan de Walsingham finished the octagon with a pierced parapet of Flamboyant tracery, at a height of 114 ft. above the nave pavement. The parapet on each cardinal side has part of a pinnacle set diagonally in its centre. Each pier of the octagon is crowned with an irregular panelled octangular turret. The existing capitular body, being imbued with an intense reverence for the wonderful building entrusted to their care (as shown by an expenditure thereon of 57,000*l.* during the last thirty years), instructed Sir Gilbert Scott to prepare a design for completing Alan de Walsingham's stonework. A perspective view of this design was published in the *Builder*. During the past year (1875) the Dean made an appeal to the public for funds, which was so amply responded to that the Dean and Chapter are about entering into a contract for finishing, in Clipsham stone, this important work, after it has remained in abeyance for 545 years. Alan de Walsingham also constructed upon the solid rock, in the outer lines of the aisle walls, four piers or buttresses, each capped with a stone pinnacle and, receiving a pair of radial flying buttresses, forming two angles of the octagon. There were two beautifully-sculptured Norman doorways opening into the cloister at the south-west outer angle, just at the point where an abutting pier to a flying-buttress was needed. He treated the Norman work in the most conservative manner by incorporating the doorways there most skilfully with his own new pier, which sheer constructive necessity demanded. The stonework of the octagon being so far completed, Alan de Walsingham determined to roof the structure, which is 74 ft. in diameter, with oak. The first step which he took towards solving this difficult problem was to raise upon a stone corbel in each of the eight piers, and on the same level as the springing of the four great cardinal arches, a series of vaulting ribs terminating at a curb 93 ft. above the pavement. This oak curb forms a regular octagon, 13 ft. on each outer face, but the octangular sides of the curb are set obliquely to the faces of the stone octagon. This arrangement, though it gives an infinite variety of curved lines to the vaulting ribs seen from below, causes a certain distortion in the ribs themselves. Though each rib was no doubt originally set out by "ordinates," it is impossible now to test their accuracy, seeing that the summer heat of five centuries has twisted many of them into fantastic curves similar to those which may be noticed in the spire of Chesterfield Church. It is recorded that Alan's greatest anxiety was caused by the difficulty he experienced in finding, in an accessible spot, eight sound trees of sufficient size to make the eight angular posts of his lantern. After great labour, he succeeded in obtaining them. They were 50 ft. long, and give a sapless scantling of 2 ft. 9 in. by 1 ft. 9 in. These being moulded and framed into the curb formed the first portion of the wooden construction. At a level of 18 ft. 3 in. above the curb, a second curb is framed between the posts, forming the sills of four-light traceried windows, each being 15 ft. 5 in. between the sill and springing of the arch; at this same springing level, 130 ft. above the pavement, rises fan-vaulting to a point 152 ft. 6 in. above the pavement. The vault-ribs radiate into a magnificent central oak boss, sculptured so as to form a practical exposition of the great central doctrine of the Incarnation. The space in each bay of the lantern between the two curbs is filled in with a traceried parapet of quatrefoils, breast-high, for safety. Above that are four panels, terminating with rich tracery. The upper stage of the lantern formerly contained a peal of bells, as proved by the gooves worked in the vault-ribs by the friction of the bell-ropes, which reached to the pavement. The interior of the lantern was decorated with painting. Great doubt existed as to the design and colours. After referring to the work done by James Essex, in the last century, the lecturer mentioned that in 1845 Dean Peacock appointed Sir Gilbert Scott as architect for the restoration of the cathedral. The lantern, as now seen from the exterior, is Sir Gilbert Scott's work, based on the authority of early prints, and traces of the ancient structure. In 1873 the bissexcentenary of St. Etheldreda drew much attention to the cathedral restoration. Mr. Gambier Parry, who had already painted half of the nave roof, volunteered to decorate the interior of the lantern. His generous offer was accepted, and Mr. Rowe was directed to prepare a scaffold for the purpose, as well as to make certain repairs. After giving a detailed description of the scaffold, the lecturer passed to the subject of the decoration itself, quoting, in Mr. Parry's own words, the scheme of iconography which he had devised and executed. An account of the ancient painting of the woodwork was found among the archives of the cathedral, and shows that the decoration must have been very rich and elaborate, the colours enumerated being vermilion, orpiment azure, verdigris, cynoper or dragon-blood, red lead, white lead, gold and silver leaf. This work was executed between the years 1335 and 1346. The wages of the chief workman, Walter (*pictor*), were 8d. per week, *præter mensam et robam*. Oil is mentioned as specially purchased *pro colore tempera*, and solution of parchment was used as size. Mr. Rowe's paper was illustrated by a number of large diagrams and a model of the timbers of the lantern. A series of photographs from Mr. Parry's decoration was also exhibited.

In the discussion which followed,

Canon Lowe, as representing the Dean and Chapter of Ely, expressed his regret at the unavoidable absence of the Dean, and went on to observe that in view of the works now contemplated at Ely, the reading of Mr. Rowe's paper was extremely opportune. He should not presume to offer any opinion on the points discussed in the paper, seeing that he was in the presence of a body of professional architects, and because Mr. Stuart,—who had studied the whole of the cathedral, and whose book was still the text-book for all who wished to know anything of the cathedral,—was also present. Personally, he thanked Mr. Rowe for his able paper, and would desire to say that in Mr. Rowe the Dean and Chapter had a most worthy coadjutor in all that appertained to the preservation of the cathedral. The excellent series of measured drawings which Mr. Rowe had made of the octagon had been presented by him to the Dean and Chapter, with the view that, should any mishap unfortunately cause the destruction of the octagon, it might be reconstructed line for line, and detail by detail. He trusted, however, that the drawings would never be required for that purpose, but that they would continue to remain as a record of Mr. Rowe's zeal and ability. Under the guidance of Sir Gilbert Scott, the Dean and Chapter were about to continue the work of restoration, and to take in hand the rebuilding or completion of the stonework of the lantern. There were some debatable points upon which the Dean and Chapter would be glad of the opinion of the members of the Institute, although they placed themselves with the fullest confidence in the hands of Sir Gilbert Scott. When appeals were made for funds, intending subscribers made various suggestions and inquiries, and some of them only consented to subscribe conditionally upon certain things being done or left undone. These objectors had to be pacified, their apprehensions allayed, and their suggestions courteously received and carefully considered. Among the points upon which the Dean and Chapter would be glad to hear the opinion of the Institute or of its President, there was first of all the question whether the angular turrets rising upon the leaden part of the lantern should be crowned with wooden pinnacles? This was a point on which there was great variety of opinion expressed. Secondly, how far (taking into consideration the somewhat heavy and gloomy appearance which the lead-covered lantern presents to the eye externally), would it be desirable to relieve it with lines of gilding or some similar ornamentation? Another more important question remained for the future, for even were all doubts upon the matter resolved, the necessary funds were not yet available; he referred to the question whether the great lantern was intended by Alan de Walsingham to carry some lofty *flèche*, as a landmark for the surrounding country, or whether the lantern without a spire completely realised Walsingham's intentions. In considering this question there would arise the practical questions as to how far the addition of a *flèche* placed upon the lead-covered lantern would affect the structure below, and as to how far a lofty *flèche* rising in the open and exposed country, subject to violent gales, would affect the main principals of the lantern and even the stability of the entire fabric?

The Chairman remarked that the lantern at Ely was the work of an architect (Alan de Walsingham), who was also the third in rank as an officer of the cathedral,—viz., the sacristan. Mr. Stuart, who was present, was a not unworthy successor of Walsingham, having been sacristan for many years, during which time he had devoted a great deal of study to the cathedral, to what purpose was to be seen in his book referred to by Canon Lowe,—a book which probably no one (with the exception of Professor Willis) could have written; it was a most admirable architectural history of the cathedral.

Mr. Burges knew as much about Ely Cathedral as any man, and he recollected that he first made Mr. Burges's acquaintance there about seven-and-twenty years ago. Perhaps he had something to say on the present occasion?

Mr. Burges said he need not say that he took a very great interest in Ely Cathedral. He spent three months there of very hard work in sketching and measuring. Mr. Rowe spoke about going down to the rock. Where was the rock, how far down was it, and what was it like?

Mr. Rowe.—It is a very hard sandstone rock; so hard that it cannot be worked by tools with anything like economy. It is to be found at a depth, close to the cathedral, of only 6 ft. The first builders did not go down to the rock. Walsingham did go down to it?

The Chairman said he might perhaps be allowed to interpolate a word or two on this point, for he had seen the rock. In view of some drainage works at Ely some years ago he had to inspect the foundations of the cathedral, and he found that the Norman work went down to *a* rock, which no doubt was thought to be *the* rock, but it was only a thin bed of rock lying above the solid rock. Alan de Walsingham had found out that the rock first met with was only a thin stratum, and had gone down to the solid.

Mr. Burges.—How thick are the joints in Alan de Walsingham's work?

Mr. Rowe.—I am afraid to upset all your theories, but the joints are as fine as those of modern masonry; and that, I believe, is the reason that the work has stood so well.

Mr. Burges asked whether he was correctly informed that Mr. Gambier Parry's decorative work was a gift to the cathedral?

Canon Lowe said that in the first instance Mr. Gambier Parry painted the half of the nave entirely at his own cost, all materials, of course, being found for him. He gave his labour, and took upon himself all the expenses of his prolonged residence from home. Upon his undertaking the decoration of the lantern, he expressed his intention of giving his labour as before, but added that he should be glad to have the expenses attendant on a long stay from home considered by the Dean and Chapter, who were, of course, only too glad to assent; but when Mr. Gambier Parry had completed the work, he said he had no bill whatever to send in.

Mr. Burges said he was not quite clear on that point, and he was glad to have elicited it. With regard to Mr. Parry's work, it certainly looked very beautiful, but he was greatly surprised that Mr. Parry, an ecclesiologist and iconographer, should have violated the very first law of iconography by putting shoes on his angels' feet! Angels were the winged messengers of God, and were never properly represented unless without shoes. As to the questions submitted by Canon Lowe, he was inclined to think that while perhaps the external lead work of the octagon might be advantageously relieved, the effect of gilding would be too garish and toy-like. Gilt work always looked crude until it had been exposed for many years, or until it was so worn that there was little else but the mordant and a few specks of gold. In France, as at Amiens and Chalons-sur-Marne amongst other places, lead surfaces were very agreeably relieved with tin in combination with gilding, and the effect was very good without being glaring.

The Chairman said that traces of similar work in gold and tin were to be seen at Cologne Cathedral.

Mr. Burges said that as to Canon Lowe's question about the pinnacles or spirelets to the turrets, there were no records to enable a positive decision to be arrived at as to what was originally intended. As to the question of a crowning *flèche*, no doubt, as Pugin said, before the Perpendicular period every lantern was meant to be capped with a spire. But these were purely questions of archæology, and in their solution the Dean and Chapter must trust to their architect, Sir Gilbert Scott, to dictate to whom

would be an impertinence. If a lot of holes were found in the top beams of the lantern there would be no doubt about the matter. He would suggest that a large model of the cathedral be made, and the effect tried with a spire and without it; drawings would not enable a correct judgment to be arrived at. Mr. Rowe had spoken of some figures for the niches which were to cost 20*l.* each; he (Mr. Burges) would suggest very great caution in that direction. He wished to ask another question, which was one for the members of the Institute and the profession generally. Suppose we had to build the lantern at Ely in the present day: should we do it in fir or in oak? Would it not be better done in fir? and if not, why not? Would it last longer in oak, which had a tendency to twist, from which fir was free? In the construction of such work, would not deal, bound with iron straps and bolts, last as long, and be as strong as oak-beams tenoned and trenailed together? Incidentally, Mr. Burges mentioned an expedient resorted to in France to prevent the decay which was inevitable when iron and oak were in contact; this consisted in placing a piece of painted paper between the iron and the oak. In conclusion, he said he should like to know when deal first came into general use for large roofs. Which was the oldest fir roof, and how had it stood? Many architects in the present day advocated the use of oak for roofs; but if the lantern at Ely had to be reconstructed in the present day oak could not be used, for it was too expensive, and had other disadvantages.

Mr. Wyatt Papworth moved a vote of thanks to Mr. Rowe for his admirable paper with especial pleasure, for he had the good fortune to be one of a small party of architects who spent some hours in Ely Cathedral last autumn, under the guidance of Mr. Rowe. As to the relative advantages and disadvantages of fir and oak, he could only refer inquirers to his (Mr. Papworth's) paper, read before the Institute twenty years ago.

Mr. C. Fowler seconded the proposition with equal pleasure, as he happened to be one of the party referred to by Mr. Papworth.

Mr. C. F. Hayward, as another of the same party, cordially supported the motion, and recommended all who wanted a holiday, combined with proper instruction, to go down to Ely and spend a few days, or even a few hours, in studying the cathedral.

The Chairman, in putting the motion, said he could only add his heartfelt testimony to Mr. Rowe for the excellent manner in which he had described the cathedral, and also to express his great gratification, although not without some personal humiliation, at seeing that Mr. Rowe had performed so nobly what all church restorers ought to do, but which, unfortunately, was generally neglected, *i.e.*, to prepare a set of perfectly correct and accurate measured drawings of works upon which they were engaged while they had the opportunity. All architects engaged on restorations ought to do this, and if they did, it would form a most valuable record, which would be of incalculable value in the future. He thought that Ely Cathedral furnished a distinct proof, if any were needed, that the term "workman" did not in the Middle Ages convey the idea of an inferior or comparatively uneducated person, for Alan de Walsingham, although described on his tomb as a "workman" (*operatorum*), was certainly far more than what was now implied by the word. There was no doubt, however, that Walsingham was the architect of a great deal more of the building than was comprised in the octagon, for he was evidently the general architect of the fabric for a very long period. As to the questions *vs* fir and oak, the oldest fir structure he (Sir Gilbert) had seen was built in 1520, being the roof of Old Aberdeen Cathedral. It was, however, very much decayed when he saw it, besides having been greatly mutilated. He was not in a position to say with certainty whether Walsingham had intended the lantern to be crowned with a spire. Possibly it might have been intended to have had an open-work spire.

The vote of thanks to Mr. Rowe having been carried by acclamation,

Mr. Rowe, in acknowledgment, said that, as had already been alluded to, he had had the privilege of conducting a few of the members of the Institute (who were well known, he believed, among the members of the Institute as "F.A.B.S.") over the cathedral last year, and if a small party was again made up, he should have pleasure in conducting it over the cathedral, provided he had timely notice.

The meeting then terminated. A special general meeting (of members only) will be held on Monday evening next, the 10th inst., to discuss the report of the special committee as to the financial condition of the Institute, and the best mode of increasing its efficiency.

THE ART-UNION OF LONDON PRINT.

WE have received an impression of the plate prepared by the Council of this Art-Union for the subscribers of the current year, "The Death of Nelson," engraved in pure line by Mr. C. W. Sharpe, from the original wall-painting in the palace of Westminster, by the late Daniel Maclise. It is a companion to the "Meeting of Wellington and Blucher after Waterloo," produced for the same association for the past year.

By the report which accompanied the proof, we learn that the amount of subscriptions for the latter plate reached the sum of 18,926*l.* (being more than 1,000*l.* beyond the largest amount ever previously subscribed), from which we may conclude that nearly that number of persons took the print of Wellington and Blucher, an issue of a *large plate* which we take to be probably unequalled in the history of line-engraving. Of course, some years have been required to produce so large a number of impressions, and, we were assured, and took an opportunity of personally verifying the statement, that the last impression taken from the plate is in every respect equal to the first; every delicate nuance of light and shade, the half-tints, in which we have been accustomed to look for wear in plates having a long run, are preserved with perfect fidelity. This result could only have been attained through Mr. Joubert's valuable discovery of steel-facing, by which the copper-plate is covered with an infinitesimally-thin skin of steel; this, on showing the slightest symptom of wear, is removed, and a new facing put on, leaving the copper-plate quite untouched and ready to go on supplying any number of impressions. We are told that there is a great demand for the Wellington plate still, by new subscribers, with a view to pairing with the new plate of Nelson. The mention of these large prints recalls a statement we met with in one of the Art-Union reports, some years since, to the effect that an impression had arisen in some quarters that the issue of *large* plates to the subscribers was a mistake, on account of the expense of framing, and the difficulty of stowing them in moderate-sized houses, and that, to test the truth of the assertion, the Council had a return made of the relative numbers taken by the public of the several plates produced for them, and it was found, that of the three largest plates in the list, upwards of 50,000 had been taken, the aggregate number of subscribers in the three years being 39,855, showing that in *other years* more than 10,000 of these plates had been chosen in preference to the smaller subjects forming the regular issue of those years. It is a healthy symptom of public taste that the print-shops now teem with engravings, two or three new ones appearing every week, instead of the photographs and chromolithographs so much in vogue a year or two ago; but the fact still remains that the Art-Union alone gives commissions for large plates in *pure line*.

The plate of the death of Nelson is a worthy pendent to that of last year; the interest in the subject with a sea-loving people like the English is sure to be even greater than that in a military theme, and the treatment is perhaps even more successful,—the grouping is less crowded, and the interest, by the skilful treatment of the artist, is intensely centred in the principal figure, the dying hero,—all the accessories, guns and gun-carriages, shot and shell,—the rigging of the *Victory* and of the *Redoutable* entangled with it, are depicted with that mastery of detail which was Maclise's great characteristic; the expression of the little powder-monkey running across with a cartridge; the slate with the memorable words of the day, "England expects that every man will do his duty"; the men whispering to each other of the fall of their beloved commander, though not, for a moment, offering to leave their posts,—all are given with the most life-like and touching pathos.

We have no doubt that the number of subscribers for this truly national work will be, at least, equal to that of the past year.

The Society's almanack, also sent to us, contains some useful information as to the art-societies of London, and the arrangements of scientific and literary meetings.

SOME OLD HOUSES AND THEIR STORIES.

THE ROYAL SOCIETY'S FIRST HOUSE.

WE go back to about the middle of the seventeenth century, or a few years earlier, and amidst the horrors, miseries, and turbulent excitement of civil war, the contending of furious cavaliers and Parliamentarians, Puritans and Episcopalians, we enter the house of a London apothecary, and look in upon a strangely quiet little group of men, earnestly thoughtful, and absorbed in the discussion of some mysterious chemical question. Mr., afterwards Sir, William Petty is their host the landlord of the house in which he lodges has supplied them with drugs, and they have resolved themselves into a club, from which those elements of the outer strife and bloodshed, politics and religion, are to be rigorously excluded.

They are men who were not content that philosophy should continue to stagnate within the narrow bounds of very ancient knowledge and experience, and their purpose, as a club, is to free its beneficent waters, and set them flowing through the land, by their natural courses, onward to join the vast inexhaustible and mysterious ocean of life which surrounds them. They are tired of thinking no thoughts of their own; of continually putting into and pulling out of their minds the same antiquated ideas; and they have resolved by original research and investigation to plough, plant, and reap for themselves, with a view to the improvement and extension of their intellectual produce; to make wisdom more fruitful, and learning no longer barren.

Here, amongst them, is Thomas Willis, a young man destined to achieve great fame as a physician, and Dr. Wilkins, who will be Bishop of Chester, and is now a daring theorist, proof against ridicule, who believes a new world is to be discovered in the moon, and that it is quite possible by the aid of flying-machines to reach it. You may remember the story told of him when a certain wildly ambitious dame of lofty rank mockingly asked how, while on his way to the moon, he would contrive to bait; and he replied by expressing surprise that a lady who built great castles in the air should ask such a question. Here, too, is Seth Ward, a clergyman who will rather sacrifice his Cambridge fellowship than subscribe to the "solemn league and covenant," and who will become the Savilian Professor of Astronomy at Oxford; and there is Laurence Rooke, a young man whose knowledge of astronomy is already great. He will be the Gresham Professor of Geometry at Oxford. Waller, the famous mathematical scholar, is here; and Mr. Haak, a German, who had the honour of originating the memorable little club; together with Samuel Foster, the Professor of Astronomy at Gresham College, Bishopsgate, a great master of ancient languages; Dr. Wallis, who is writing a new book on Mechanics; Dr. Goddard, the Roundhead, who is said to have constructed the first English telescope,—he who afterwards rose so high in the favour of Oliver Cromwell; and Dr. Ent, another well-known physician of the day.

The little club, as time progresses, grows apace, meeting sometimes as the guests of Mr. Petty, sometimes in the house of Mr. Haak, and sometimes at Dr. Goddard's lodgings in Wood-street, Cheapside, occasionally at the great mansion of the late Sir Thomas Gresham, in Bishopsgate-street, called by courtesy, and in accordance with the will and purpose of its late benevolent owner,—to the annoyance of Oxford and Cambridge,—Gresham College; and sometimes at Oxford, where, in 1648–9, some of the members became residents; but most frequently in Dr. Wilkins' great room over the gateway of Wadham College. These, as John Evelyn says, "were the persons to whom the world stands obliged for the promoting of that generous and real knowledge which gave the ferment that has ever since obtained."

Growing in numbers and importance, we find the Club holding its meetings weekly as the Philosophical College, in the Bishopsgate-street mansion, where it was very comfortably housed and provided for, with a great room for its meetings, and smaller rooms for varied uses, amongst the open courts, covered walks, gardens, stables, offices, and almshouses generously bequeathed to the nation for the increase of learning, and extending from Bishopsgate-street westwards to Broad-street.

On the death of the great Protector, when turbulent demonstrations, ominous signs, fears, terrors, threatenings, and the warfare of all kinds

of conflicting interests and purposes arose, Gresham College was occupied by the military as a garrison, and all the professors, save one, perforce, abandoned it. This was in September, 1658, and the one who did not abandon the college was a member of the Philosophical College. In a letter of Bishop Sprat to Professor Wren, afterwards Sir Christopher, and the architect of St. Paul's, dated 1658, we read:—"This day I went to visit Gresham College, but found the place in such a nasty condition, so defiled, and the smells so infernal, that if you should now come to make use of your tube, it would be like Dives looking out of hell into heaven. Dr. Goddard, of all your colleagues, keeps possession, which he never could be able to do, had he not before prepared his nose for camp perfumes by his voyages into Scotland, and had he not such excellent restoratives in his cellars."* The tube referred to here is of course the great reflecting telescope which Sir Chistopher Wren, who was then quite a young man, afterwards perfected, to the delight of, and probably with the assistance of, the Royal Society's eminent astronomers, although Wren was then Professor of Astronomy at Gresham College, a post which he had held but a year.

Richard Cromwell contrived to make himself master of the army in the January of that year, but in this month of September the rude soldiers were mutinous, and the overbearing arrogant officers discontented, while Charles Stuart in Brussels was anxiously hopeful of a restoration, for which General Monk in Scotland was rapidly paving the way. In October, ten days of complete anarchy were succeeded by a military government called a "Committee of Public Safety," by the raising and marching of armed bodies of men in every direction, and then by the commencement of General Monk's famous march towards England. Dreadfully ominous as all these signs were, and unsettled as the country then was, it could hardly be expected that the Philosophical College would continue its work. With the Restoration, however, things fell back into their usual grooves, and the weekly meetings of the Philosophers' Society at Gresham College were duly resumed.

On April 22nd, 1662, happily influenced, perhaps, by what he had seen abroad, or wisely alive to the vast importance of scientific investigations, King Charles II. formally constituted the Philosophic College a body politic and corporate, by the appellation of "The President, Council, and Fellows of the Royal Society of London for the Improvement of Natural Knowledge." The members who had so laboriously won their way to so honourable a recognition of their just importance felt, doubtless, no little pride and exultation as they for the first time used that stately privilege, the Royal Society's seal.† But no accession of personal dignity and honour could slacken their zeal for the objects which had been their bond of unity in the past, or make them forget the noble spirit of their self-created mission. The month of their charter was that in which popular religious bigotry, of all bigotry the worst,—rising blind, deaf, and without reason to its most savage state of cruelty and hate,—had so clamoured against Papists and Dissenters that the Government had felt constrained, as a matter of policy, to issue a proclamation against Popish priests, and to address to his Majesty a protest against his admitted inclination to be merciful to Dissenters from the creed of the State. In the face of this it was agreed by one of the Royal Society's resolutions, in which the noble principles it had adopted were newly declared, to admit as sharers in its work and privileges men of all religions, professions, and nations, "in order that the knowledge of nature might be freed from the prejudices of sect, and from a bias in favour of any particular branch of learning" (which is another common source of bigotry and consequent dogmatism), "and that all mankind might as much as possible be engaged in the pursuit of philosophy," which it was proposed "to reform not by laws and ceremonies, but by practice and example." In the same resolutions it was agreed "That records should be made of all works of nature and art of which any account could be obtained, so that the present age and posterity might be able to mark the errors which had been strengthened by long prescription, to restore truths which have long been neglected, and to extend the uses of those already known, thus making the way easier to truths as yet unknown." With such ends in view nine distinct committees were at once formed, each with its sphere of active employment in experiment and inquiry clearly defined, and in one or another of these were to be found nearly all the eminent thinkers and writers of the time,—Wren, Waller, Cowley, Denham, Dryden, Ashmole, Aubrey, Barrow, Boyle, Lord Brouncker, and Sir Robert Moray, their first president.

We visited the Society in the room over the apothecary's shop; let us take another peep at it in Gresham College in company with one who has chronicled what he saw there,—Sorbiere, the historiographer of Louis XIII. We reach the extensive range of buildings forming the college, noting the reading-hall in front by its gable-end. We pass into a quadrangle, about 100 *ft.* square, under arcades over which are long galleries, and on one side of which are the professors' houses. Into a large wainscoted room we go, noting a great table before the wide chimney and carved chimney-piece, and seven or eight tall-backed green-seated chairs about it. Arranged one above another in amphitheatre fashion are rows of wooden benches, the seats of which are covered with matting, on one of which we pose ourselves, where the members of the Society are in rows and groups all pleasantly chatting and talking amongst themselves. Then to us comes the president, Sir Robert Moray, who is ushered in by the beadle bearing a mace, and takes his seat amidst a sudden silence in an arm-chair, with the table before and the chimney behind him. As the beadle retires take notice of his mace. It was thought to be that which was referred to by Cromwell in the House of Commons, when he bade the armed men "Take away that bauble." The president, with his little wooden mallet, strikes the table, and in an instant every voice is hushed, and one of the most zealous and industrious members, Mr. John Evelyn, stepping forward, removes his hat as a mark of respect to the president, who, by a sign, commands him to be covered, on which he resumes it and proceeds to describe some experiments he has been performing on "the sensitive plant and *humilis*, which," he said, "contracted with the least touch of the sun through a burning-glass, though it rises and opens only when it shines on it."* A murmur of voices follows the close of this singular communication. Then a discussion arises, but, as Sorbiere says,—"There is nobody eager to speak that makes a long harangue, or (is) intent upon saying all he knows; he is never interrupted that speaks; and difference of opinion causes no manner of excitement, nor as much as a disobliging way of speech," a sure sign that none but gentlemen are present.

The same authority, who probably visited the Gresham College meetings more than once, says:—"There is nothing that seemed to me to be more civil, respectful, and better managed than this meeting; and if there is any private discourse held between any while a member is speaking, they only whisper, and the least sign from the president causes a sudden stop, though they have not told their mind out. I took special notice of this conduct in a body consisting of so many persons and of such different nations."

No rule is, however, without its exceptions, nor was the good rule thus lauded. We come out from the meeting under an open archway leading to the stables, over which are two figures, one standing over another on his knees, with a drawn sword. We are told that they represent two members of the Society, viz., Drs. Mead and Woodward, who had quarrelled, and, meeting here, fought. The standing figure, Mead, asked the kneeling figure, Woodward, if he would beg his life, and the latter, who in 1710 was expelled the Society for insulting Sir Hans Sloane while he was reading a paper, replied:—"No, Doctor, that I will not, till I am your patient," but, nevertheless, consented to confess his defeat, and surrender his weapon. He was a quarrelsome fellow, it appears, and must have bitterly resented this permanent chronicle of his humiliation. The incident was made the subject of a variety of jokes at the time, and, indeed, the Society was most plentifully bespattered with ridicule, both then and afterwards. You may remember "Hudibras" satirises these gallant and wise old philosophers most mercilessly, and was especially severe with a bitter production in rhyme called "The Elephant in the Moon." The wise man whose wonderful discovery is due to the presence of a mouse in his telescope was probably intended for Dr. Wilkins. The merry monarch had his joke with them also, it is said, by setting the philosophers to account for some effect which never had been, and never could be. They continued, too, to be ridiculed and sneered at, as they sometimes are even nowadays by philosophers, who, seeing so much clearer than they did by the light they had lighted for them, laugh at their awkward gropings about in the dark for the matches wherewith the little candle, which throws its light so far at last, was fairly lighted to burn brighter and brighter with its ever-growing flame.

But really it does appear funny to see these grave, sober, stately philosophers desperately puzzled by Prince Rupert's drops, sent to them for investigation by their royal patron, the King, having been purchased, as it seems, in Rosemary-lane, and appointing a special committee of investigation to visit the glass-house at Woolwich, and there experimentalise with them. It certainly is amusing to see them with a little kitten in their midst breathlessly anxious as they pricked it with a poisoned East Indian dagger, also sent by the king, which had previously been carefully warmed, and was expected to produce immediate death. But the victim's death was vainly watched for, and when the meeting broke up the poor little animal was still alive, and so remained.

It is amusing, too, when we note the patient care and earnestness with which, at great trouble and expense, they pursued their credulous inquiries concerning the wood that attracted fishes and the fish that always turned to the quarter whence the wind was coming when suspended by a thread; as to whether snow flakes were, as reported, larger in some countries than they are in others, and whether young vipers could be produced from the liver and lungs of old vipers, ground into a powder; as to whether the corn rained down from Heaven at Norwich would, if planted, grow, and as to the nature of the white powder which at once made cold water hot. Nor is it, with the light we have from the candle they lighted, remember, less curious to see them full of child-like wonder performing their experiments with the horn they believed to be that of the unicorn, setting a spider in the middle of a circle of powder made therefrom, anxiously watching it, and very much puzzled by its contemptuous disregard of their efforts to confine it within that supposed mysteriously wonderful circle. Again and again was the spider caught and put back within the magic powder. Again and again did the long-legged insect straddle indifferently over it and hurry away. But once—the eagerly bent-forward heads of the philosophers noted it with a sudden start—once the spider while in the midst of the powder actually paused! Imagine how they held their breath amidst profound stillness while every distended eye was full of startled expectation. But nothing wonderful came of it. The spider, having made up its mind which way to go, pursued its scrambling way as before. It was only a little uncertainty on its part—nothing more. They write to one of their foreign correspondents—one Sir Philberto Vernelli, "resident in Batavia in Java and Major"—requesting him to ascertain "whether diamonds and other precious stones grow again after three or four years in the same places where they have been digged out;" and "What river is that in Java that turns wood to stone?" and again, "Whether in the island of Sumbero, which lieth northward of Sumatra about eight degrees northern latitude, there be found such a vegetable as Mr. James Lancaster relates to have seen, which grows up to a tree, shrinks down, when one offers to pluck it up, into the ground, and would quite shrink (down) unless held very hard? And whether the same, being forcibly plucked up, hath a worm for its root, diminishing more and more according as the tree groweth in greatness; and, as soon as the worm is wholly turned into the tree, rooting in the ground, and so growing great? And whether the same, plucked up young, turns up by the time it is dry into a hard stone much like to white coral?" Things quite as extraordinary crop up in old minutes of the Society wherein we read of "Burning-*glasses* made of ice," of "snake-stones and other antidotes," of frozen swallows taken from under the ice of rivers and restored to life, of birds in shells adhering to trees in multitudes.

The spirit of simple earnestness and humility so clearly visible in these early inquiries into things most incredible and strange crops up also in the first Catalogue of the Society's Museum, which was first established in Gresham College,

* Published in the "Parentalia."

† Pepys says,—"I saw the Royal Society bring in their new book, wherein is nobly writ their charter and laws, and comes to be signed by the Duke as a Fellow, and all the Fellows are to be entered there, and lie as a monument; and the king hath put his with the word 'Founder.'"

* The Diary of John Evelyn, p. 277.

Bishopsgate, wherein we are told how, on certain occasions, the porcupine shoots out its quills at pursuing enemies; how certain squirrels cross rivers by the aid of bark from a tree, and erect their tails to serve as sails; how elephants go mad in winter when it begins to rain, "and so continue from April to September chained to some tree, and then become tame again"; how unfortunate "tortoises, when turned on their backs, will sometimes fetch deep sighs, and shed abundance of tears"; how the feathers of the humming-bird are "set in gold, and sell at a great rate," and of "a mountain-cabbage one reported 300 ft. high." And for the collection itself the same credulity accepted everything, the absurdity of which had not been fairly demonstrated. Thus we find, amongst other similar wonders, it contained "a bone, said to be taken out of a mermaid's head"; "a stag-beetle, whose horns, worn in a ring, are good against the cramp"; "a siphalter, said, with its sucker, to fasten on a ship, and stop it under sail"; and "the white shark, which sometimes swallows men whole."

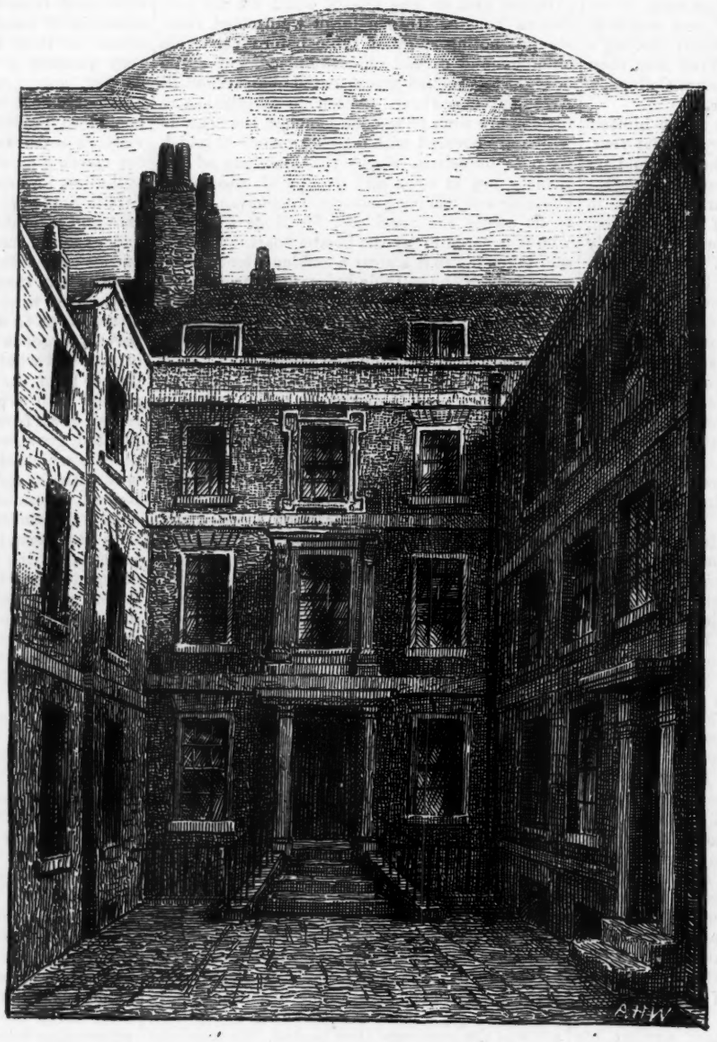
The Great Fire of London in 1666 once more drove the Royal Society from Gresham College, which, escaping the flames, was for several years "employed for carrying on the trade and transacting the public affairs of the City. To it went the Lord Mayors and the Mercers' Company, and in it were established temporarily the City courts and offices. In the south and west galleries, and in the piazza underneath them, shops were constructed for the sale of necessaries. In the quadrangle the merchants met on 'Change, for the Royal Exchange had been destroyed, and in the gardens and under the almshouses of the professors sheds clustered for the accommodation of burnt-out citizens.

Then Henry Howard, of Norfolk, gave the Society house-room in Arundel House, in the Strand, and at the same time presented to them the whole of his grandfather's famous library, which Samuel Pepys, in his Diary, informs us was then valued at a thousand pounds.

But we are filling our space much too rapidly, seeing that we have not yet got to the house of which we have to tell our story. We must here turn off from the Strand, and hurry away into Fleet-street.

Fleet-street and its tributary thoroughfares seem the most wonderful places in the world to those who love the interesting memories of which they are so curiously prolific; memories which powerfully affect the feelings or awaken recollections of the deepest interest; which are tragic and sad, gloomy and cheerful; which range from the greatest topics to the smallest, and are by turns social, religious, political, criminal, regal, legal, warlike, commercial, poetical, literary, artistic, and scientific. Trace back almost any phase of society, or any of our progressive social improvements, and you are sure to find Fleet-street cropping up here or there in connexion therewith. Take up the lives of persons most eminent in the past for their achievements in almost any of the multifarious ways wherein fame, in varying kinds and degrees, has been attained, and the chances are greatly in favour of your finding something or other which carries you straight to Fleet-street. What a host of woful memories cling about the heads on Temple Bar! What stories of political turbulence and stern rude popular protests against tyranny and injustice belong to the poor old much-abused Bar itself! The old printers, the old poet players, with Shakspeare at their head, and famous shop-keepers; the old newspapers, old publishers, old taverns, not forgetting "The Devil" nor "The Mitre," and the great wits, poets, philosophers, artists, lawyers, journalists, statesmen, soldiers, and noblemen who wrote for the one or frequented the other, are all brought to mind with Fleet-street. The Kit-cat Club, with Addison, Garth, Sir Richard Steele, and many another of its celebrities, belongs to Fleet-street. The changeful bygone customs, fashions, and amusements of the town are almost all historically connected with Fleet-street. There was perhaps something of this in Boswell's reply to Johnson's question one day when they were walking in Greenwich Park, and the latter having asked the former, "Is not this very fine?" Boswell replied, "Yes, sir, but not equal to Fleet-street"; when Johnson responded, "You are right, sir."

But our subject is running away with us again, for our business is not with Fleet-street, but with one of its tributary courts. As you pass along the famous old thoroughfare towards Temple Bar, you will find on your right hand Crane-court, a little, quiet, dull, paved place, at the end of which facing the entry stands the old-fashioned brick house shown in our sketch. This house was built by Sir Christopher Wren, for the Royal Society, in the year 1710, on the site of an old dilapidated building which the Society had purchased of its owner, Dr. Nicholas Barebone, who was a son of that Praise-God-Barebone who gave his name to a Parliament of which he was the most prominent member. The Royal Society had left Arundel House, and returned to Gresham College after the fire in 1673, where it continued to meet until, to accommodate the Mercers' Company, it removed into Fleet-street, in 1710, to this new house in Crane-court, the first and only house it ever called its own. Here in Fleet-street it remained located seventy-two years before it removed to Somerset House, in 1782, doing an amount of national service, to chronicle which would require a large and portly volume. The promotion of inoculation received its attention from 1714 to 1722; electrical experiments were the chief features of its efforts of 1745; ventilation and the suppression of fevers absorbed the efforts of 1750. In 1757 thermometers and the laws of light were the topics of investigation; astronomy came to the fore in the year following, and the Greenwich Observatory followed; and in the succeeding years were directly and indirectly productive of an amount of real substantial good, by which the whole world has benefited, and which should be amply sufficient to make the story of this old house a deeply interesting one, and the house itself a relic in every way worthy of the most careful preservation.



The Royal Society's First House.

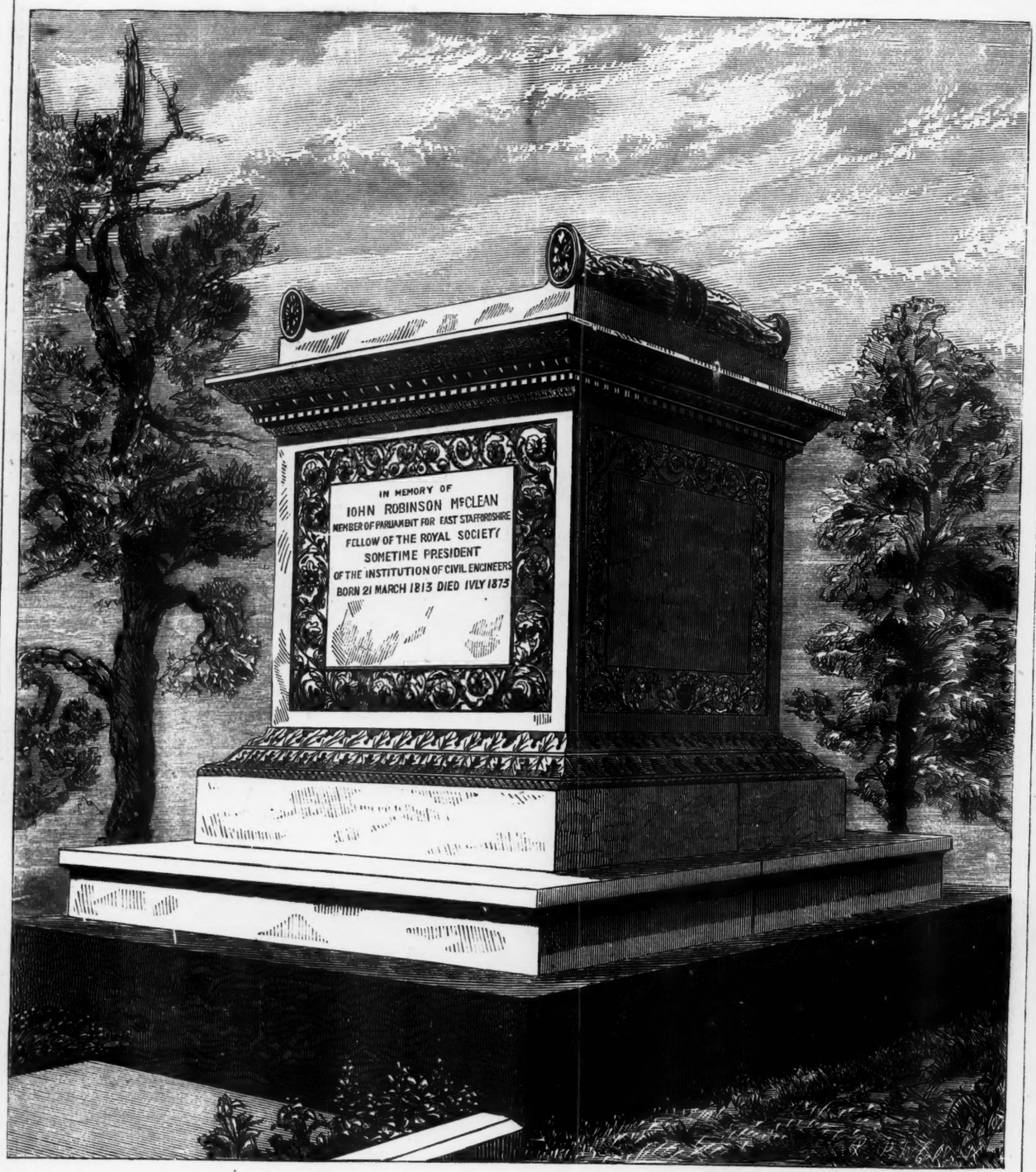
The new house had an extensive garden,—you must not, of course, look for it now,—wherein the Society erected a place for its museum, and the house was in other respects advantageous, but many of the members objected to it. A pamphlet on the subject, published in 1710 or 1711, says,—"The approach to it, I confess, is very fair and handsome, through a long court; but, then, they (the members) have no other property in this than in the street before it, and in a heavy rain a man may hardly escape being thoroughly wet before he can pass through it. The front of the house towards the garden is nearly half as long again as that towards Crane-court. Upon the ground-floor there is a little hall, and a direct passage down the stairs into the gardens, and on each side of it a little room. The stairs are easy which carry you up to the next floor. Here there is a room fronting the court, directly over the hall; and towards the garden is the meeting-room, and at the end another, also fronting the garden. There are three rooms upon the next floor. These are all that are as yet provided for the reception of the Society, except you will have the garrets, a platform of lead over them, and the usual cellars, &c., below, of which they have more and better at Gresham College."

It was our intention to look in upon the Society in Crane-court, as we have done elsewhere, some evening, when the lamp over the entrance to the court, being lighted, announced its meeting-night, and we also meant to dwell more fully upon its numerous and most important doings in Fleet-street. Again, it was our intention to trace from it those benefits and blessings in which millions of people have shared; to show how, rising from the little spring over the apothecary's shop, it widened into a magnificent river, and gave birth to a thousand fertilising streams in the shape of kindred societies, each occupied with some one special branch of that knowledge of which it was the noble parent and the first promoter. But although we have left so much out that it makes us sigh, we have put so much in that we fear it will be thought the space we occupy is much too large, and therefore we now put aside our pen.

DECEASED MASTERS, BURLINGTON HOUSE.

THE Exhibition of works by the Old Masters and by deceased Masters of the British School, now open in Burlington House, consists of 285 pictures, and is very interesting. The collection includes 30 works by Sir Joshua Reynolds, and 19 by Gainsborough; 6 by Rubens, 7 by Titian, and 9 by Vandyck.

We shall take an early opportunity to speak of them.


IN MEMORY OF
JOHN ROBINSON McCLEAN
MEMBER OF PARLIAMENT FOR EAST STAFFORDSHIRE
FELLOW OF THE ROYAL SOCIETY
SOMETIME PRESIDENT
OF THE INSTITUTION OF CIVIL ENGINEERS
BORN 21 MARCH 1813 DIED 1VLY 1873

TOMB OF THE LATE MR. J. R. McCLEAN, C.E., F.R.S., KENSAL GREEN CEMETERY.

AN ENGINEER'S TOMB.

MR. JOHN ROBINSON MCCLEAN was born in Belfast in the year 1813, and having received a good general education, he studied two years at the University of Glasgow, at the same time pursuing practical studies in engineering and surveying. On leaving Glasgow he entered the office of Messrs. Walker & Burges, civil engineers, and remained with them until 1844, during which time he was employed on several important works. In 1844 he commenced practice in London as a civil engineer; and from this period he became a man of superior rank in his profession, and in every way qualified to take a very prominent part.

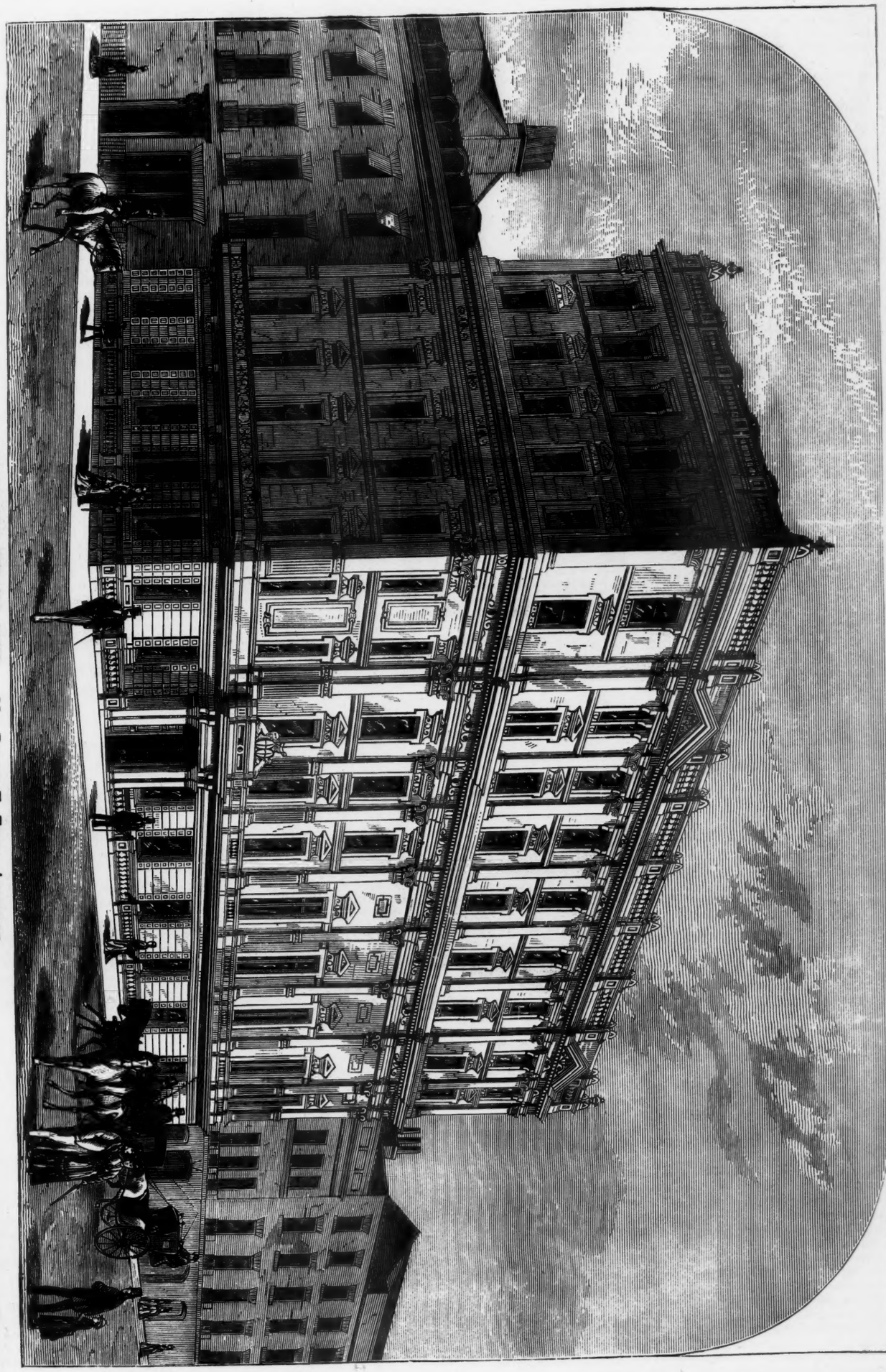
Amongst his chief works may be named Furness Railway, Barrow Docks, South Staffordshire Railway, Birmingham, Wolverhampton, and Dudley Railways, and South Staffordshire Waterworks.

In 1862, upon the death of Mr. James Walker, whose pupil and assistant, as we have mentioned, Mr. McClean had formerly been, viz., from 1837 to 1844, he was appointed Government engineer to the harbours of Dover, Alderney, St. Catherine's, Jersey; also for the Plymouth Breakwater, and the Shovel Rock Fort at Plymouth.

Mr. McClean was also appointed at different times on the following Royal Commissions, viz., that for the Thames Embankment, for the Cattle Plague, for Railways, on the Sanitary Commission, &c. He was president of the Institution of Civil Engineers during the years 1864 and 1865. He took a warm interest as president to secure the creation of the benevolent fund of that Institution. In 1868 Mr. McClean retired from the active exercise of his profession, and at the same time entered Parliament as member for the eastern division of the county of Staffordshire. He was consistently through life a Liberal in his politics. In 1869 he was elected fellow of the Royal Society, also a Lieut.-Col. of the Railway Volunteer Staff Corps.

In the latter part of his life he suffered from ill-health, and died on the 13th of July, 1873, at Stonehouse, near Broadstairs, Kent, at the comparatively early age of sixty years, his career having been at once active, useful, and honourable. He lies interred at Kensal-green Cemetery, where a monument has been erected to his memory by his family. The accompanying engraving will serve to illustrate it.

The monument is from the designs of the late Mr. Edward Adams, who has taken his *motif* from a tomb at Pompeii, viz., that to Nævoleia Tyché, which he studied on the spot. The work has been executed in solid Carrara marble, by Mr. George Sinclair, statuary, at his works, in Marshall-street, Golden-square, and reflects much credit upon him and his assistants for the goodness of the workmanship. The steps forming the base are of granite.



HANOVER SQUARE CLUB.—MR. ROBERT E. TYLER, ARCHITECT.

HANOVER SQUARE CLUB.

THE alterations to the Queen's Concert Rooms, Hanover-square, with the view to forming the present house, known as the Hanover-square Club, were commenced in May last year. One of the objects in the formation of this club was the introduction of foreigners, and most of the ambassadors (according to the public prospectus) have become members, and take a great interest in its success.

Another object was to provide bedrooms for the accommodation of country and foreign members; forty of these, besides rooms for domestics, are formed above the level of the ceiling of the old concert-hall, which, to the extent of 70 ft., has been retained as the present dining-hall. To accomplish this, the tie-beams of the old roof, which held up the ceiling, had to be preserved, and truss girders, 11 ft. high, were fixed at certain distances with other girders laid across, to which the tie-beams were fastened. After this had been carried out, the queen-posts, principals, &c., were removed. The truss girders are filled in with brickwork, and form the partitions to the first tier of bedrooms. The following is a description of the building, which has been constructed under the superintendence of Mr. Robert E. Tyler, architect.

Ground-floor: to the left of the entrance-hall, which is in Hanover-street, is the newspaper-room, 36 ft. by 18 ft.; to the right, occupying the position of the old supper-room, is a lobby for hats and coats, and a corridor, 6 ft. wide, leading from which are four private dining-rooms or card-rooms, about 20 ft. by 16 ft. each.

The secretary's offices and a writing-room are 26 ft. by 25 ft. A pass door from this corridor leads to the working part of the establishment, the servants' staircase, with tradesmen's entrance, and men's water-closet, store-rooms, wine, beer, and coal cellars, and serving-room, with lift from kitchen for private dining-rooms. Opposite the tradesmen's entrance is a general lift, which delivers goods, coals, luggage, &c., to each floor, meat, and so on, direct to the larder and kitchen. The principal lavatories are in the basement, leading out from the entrance-hall. The grand staircase, which is entirely of stone, is ornamented with statues (provided by Brucciani) on each quarter-space, holding jets of gas, and at the top is a large skylight, with a handsome inner light of stained and coloured glass.

First-floor: immediately off the staircase is the smoking-room, 36 ft. long, fronting Hanover-square, and leading on to a balcony, 4 ft. wide, the length in Hanover-street being 48 ft. To the left of the staircase is a corridor 7 ft. wide, on the right of which is a card-room, 20 ft. by 16 ft., and on the left the wine bar, with a lobby for waiters at either end, that adjoining the dining-hall, which is at the end of this corridor, having a jib door. The dining-hall, which is 70 ft. by 36 ft., and 34 ft. high, has been restored and re-decorated; the east end where the Royal box formerly stood (which has been removed) is new, as also the west end, a trussed partition having been erected the whole height of the room. The well-known pictures in the ceiling, where practicable, have been restored, and new ones inserted where necessary.

On the north side of the dining-hall (formerly occupied by the tea-room) are the serving-rooms, still-room, servants' hall, housekeeper's room, and male attendants' lavatory. The kitchen and scullery, 60 ft. by 20 ft., are over these rooms, the floor being fireproof, with an open-timbered roof, and ventilators carried to the top of the main building, so as to prevent any effluvia.

The larders are also situated in the immediate vicinity of the kitchen. The boiler and kitchen fittings have been supplied by Mr. Jones, of Castle-street, Leicester-square.

On the second floor is a billiard-room for three tables, 52 ft. by 36 ft., with lavatory attached; and the drawing-room, 36 ft. by 18 ft., overlooking Hanover-square.

The third floor: leading from the grand staircase to the east end of the building, is a corridor 6 ft. wide, on either side of which are bedrooms, bath-rooms, and water-closets; separated by a lobby, housemaids' closet, lift-room, which will be used by the bedroom attendants, and to which the electric bells from the various rooms will ring. At the north-east corner is the servants' staircase from the ground-floor, with female servants' water-closets and pass-door shutting off communication from the kitchen department. A servants' staircase is continued to the upper floors, and occupies the end of the corridor. This corridor is ventilated by gratings in the floor of the corridor over, and lighted by fanlights over the bedroom doors.

The fourth floor has a corridor similar to the one beneath, with bedrooms on either side, bath-room, and water-closet. This corridor is lighted from skylights in the roof, with inner lights, the panels round which are filled in with perforated zinc.

The servants' bedrooms are in the roof, also the tanks for the hot and cold water supply.

The bells throughout are electric, by Mr. Sax. All the principal rooms are ventilated by means of the "Potts Ventilating Cornices." The cement work to the exterior of the building (which was a separate contract) is executed in Portland cement and silver sand, the work having been carried out by Messrs. Bonden & Darrell. The contract (with the exception of the external cement work) has been carried out by Messrs. McLachlan & Son; and the ironwork by Messrs. R. Moreland & Sons. The total amount expended has been upwards of 30,000*l*.

The carpets throughout the building have been specially designed and executed by Messrs. Tyler & Son, Government contractors.

PROPOSED CHANGES, ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—If, as it is said, the completion of the Suez Canal was largely aided by the unconcealed enmity of England to the scheme, the Report of the Special Committee upon the "Affairs of the Institute" has possibly acquired a revolutionary taint from the strenuous opposition of one deeply interested in the welfare of the Society. Professor Donaldson, with unusual pertinacity of argument and assertion, has protested against, not one, but every proposal now offered by the Committee—for modification or amendment—to the general body, whose charter, according to him, "maintains as much as possible, for any human composition, the moral, artistic, and intellectual position of the architect." But if it take only the traditional nine tailors to make a man, probably the seven well-known practitioners who cut and dried this report may be considered equal to one professor, however eminent. Their collective opinion is, at least, worth that of an individual superior. The latter's appeal, published in the professional journals last week, to the suffrages of architects who seldom attend a meeting in Conduit-street except to oppose all change, will, doubtless, be followed on Monday by a motion to maintain the present charter,—a course which will tend to consign the conscientious labour of months to the huge waste-paper basket of the Institute secretary. But such an easy triumph cannot save moribund regulations. At the same time, any attempt to obtain a new charter, in the face of such opposition as could be brought against the proposal, would lead to scandal and expense, neither of which can be safely incurred. Nor can the report be shelved without equal risk of moral and pecuniary loss. Unless the subject is carefully handled by both the promoters and opponents of reform, a schism is inevitable; and the Associates at least are not bound to accept a share in a catastrophe they did not precipitate and cannot avert. A majority of Fellows will remain; and eventually another financial crisis will occur, and another committee will be appointed, unless, indeed, the Institute elects to die gloriously "game" upon its funded capital,—an admirable mode of existence while it lasts, and one which enabled some of the predecessors of the present Council to declare officially that the immediate urgency of the cause for which the Special Committee was appointed had disappeared.

By the existing charter, Associates have not, and never can have, a vote,—which means that they are deprived of all practical participation in the management and business of the Institute. If the Fellows may be said to represent "householders," the Associates have not even the privilege of "lodgers,"—they are like waifs and strays, lost sheep, nullities! Yet between many of the younger Fellows and the elder Associates there is but slight difference; and the latter might undoubtedly become Fellows. But there is much to be said in explanation of the reluctance shown by many of them to accept the easy alternative. The course of early professional life does not always run smoothly; and the highest talent and most assiduous application are sometimes beaten down by adverse circumstances. Though work generally leads to work, the successful construction of one building does not always lead to that of another, and it is not unnatural that Associates in practice should be modestly anxious regarding their future. When times are hard, some rely on the lucrative employment of "taking off quantities." Some give their services honourably to builders, upholsterers, and other tradesmen. Others design for glass-painters, decorators, and sculptors, or draw on wood, or stone, or for photo-lithography. Week after week advertisements are inserted in the public journals by architects known to have been long in practice, who offer themselves as assistants. Misfortune would be sorely aggravated if such men were compelled to descend from the grade of Fellow. But there is also a sentimental side of the argument. To explain it I must invoke the shade of the late Arthur Ashpitel, who sometimes fished up Truth from the bottom of her well, and brought the young lady to Conduit-street, where, since his death, she has been less often seen. Half the buildings in England are nominally the works of Fellows; but, really, many are designed and the execution of them superintended by Associates, or men who, if they belonged to the Institute, would fill that grade. In this country, the first thing asked, when the scaffolding of a new building is removed, and the name of the nominal architect is mentioned, is, "Who did it for him?" It is a perfectly natural question; for no individual mortal could design and superintend simultaneously all the buildings which pluralist practitioners from time to time unblushingly call their own. The man who buys and sells land and houses, who values and surveys, who collects rents, and adds a general building agency to his professional practice, may become a Fellow of the Institute. There is no possible objection to such things when carried on by honourable men; but the members of a profession which thus touches upon, if it do not exceed, the confines of commerce, are unwise to ride tall horses, for they sit but loosely in the saddle. In England the modern architect is not a master-of-the-work, as he was in the Middle Ages, and as he still is, to a certain extent, in France. His functions are divided amongst several specialists, and one of these specialists is the "quantity" surveyor, who, were he not too often paid in an underhand fashion, has as much right to the Fellowship of the Institute as the valuer and the estate agent, the furniture designer, and the writer for the press. Indeed, for a long time the rights of Fellowship have been enjoyed by men known to be both regularly and casually employed by paper-stainers, upholsterers, and even builders; but to sit side by side with their employers, although upon a different social footing, has been, and is still, deemed intolerable by themselves and the majority of their colleagues.

However unanimous may be the opinion of the meeting next Monday regarding the maintenance of the present charter, the "Affairs of the Institute" cannot possibly be discussed in one evening. The advisability of altering the existing mode of administration to one more suited to a country in which from time to time Tory Governments carry sweeping measures of reform through both Houses of the Legislature, should at least be considered. As it is, the Royal Institute of British Architects does not represent the profession, because it is not managed upon native representative principles. On the contrary, its principles resemble those of a neighbouring country, which, until very lately, had an Emperor who elected a Senate, and who subsidised lieutenants to elect a Parliament. The Council of the Institute, unless surprised by a cabal, elects itself; maintains one secretary to preserve the illusion of a name; pays another to oppose honorary individual exertion; and completes the parallel by treating the reporters it invites to the meetings, not as Englishmen, trustful of a free press, usually do, but as an imperial *préfet* treated the journalists at his command. I am told that recent members of the Council already turn round upon half-empty benches and ask helplessly who shall succeed them! As their triumphs are so must be their disasters; and the "pooh-pooh" which has too long greeted an Associate who attempts to address a Special Meeting will be consistently answered when in the time of danger the man at the helm is washed overboard, and there is no one ready to take his place.

Many of the younger members entertain strange notions about the present management of the Institute. Some actually believe that the choice of a new president, of new members of

Council, and the award of the Royal gold medal, depend a great deal upon the secret nomination of the secretary, Mr. Eastlake, and such absurd rumours cause bad blood to ferment to his prejudice. But that he has too much power I am enabled to affirm. A short time ago the secretary was asked to convene a meeting of one of the few committees which sit. He replied that the Council had forbidden any committee to meet without its special leave. Three gentlemen then wrote separately to the Council declining under such circumstances to serve the Institute in any honorary capacity. No reply was vouchsafed; but one of them was privately informed that the secretary had made a mistake; and a day or two afterwards the said committee was summoned. That which is wanting in the chartered society is the force lent to the Association by its numerous committees and sub-committees. A spur to exertion is thus given to a large number of men. If the majority of those who will be present on Monday evening would honour the ordinary meetings with an occasional visit; if some would attend the committees to which their names are attached; if all would remember that paid service is necessarily limited, and that honorary labour might be boundless, then surely there would be no need of special committees to report on crises, because such calamities could not then occur. But the existence of one almost autocratic secretary is an excuse for shirking honorary work. Nor when such work is offered is it accepted by the present administration. The secretary is ordered to attend all committees, both ordinary and special; and it is certain that his presence serves to check the expression of individual opinion, since the servant of the Council is bound in honour to give a faithful report to his masters. All the committees should be periodically convened. There should be a general chairman; and each committee should appoint its own honorary secretary, who should draw up a report of proceedings to be presented to the Council through the medium of its salaried officer,—and to pay court to this gentleman should not be the only recommendation required to fill the honourable post of committee-man. At the same time, no one could do the legitimate work better than the present secretary does his; but indispensable "red tape" is not sufficient to carry out all that is required to be done in his department. To obtain the promise of sessional papers, to induce men whose opinions are worth having to attend a particular meeting, a lithographed form of letter is not enough. An honorary officer must wait upon those whose favours the Institute solicits; for upon the courtesies of life, more than upon the conventionalities of business, depend the welfare and progress of a professional guild.

While there is no living member of the Institute more worthy of general esteem than Professor Donaldson, there is a dead architect whose memory is at any rate honoured as much. On the 23rd of April, 1860, the late Mr. Cockerell, in one of those "imaginative or artistic disquisitions," as Mr. T. H. Wyatt has termed similar addresses, said:—"We hope to form schools of our own and to offer collegiate grades which will reward eminence and recommend by certificates to the public patronage. These last, already established in the shape of diplomas in the colleges of Law and Physic, prove the advantage of their being no less adopted in the Institute of British Architects." A few years before these words were spoken, Professor Donaldson attended a meeting of the Architectural Association at Lyon's Inn Hall, and offered the then members terms of amalgamation with the Institute. He was half laughed at, and his offer wholly rejected. I remember, then little better than a boy, that I thought we treated the Professor with scant courtesy. But the sequel has proved that we were right. The gauntlet of education which President Cockerell afterwards threw down was taken up by the Architectural Association. From all parts of the United Kingdom come praises of the art and science classes formed and carried on by the younger members of the profession, coupled with regrets that the provinces are not equally favoured. One of the greatest of modern Frenchmen has strengthened them with his mature approbation. On the opening night of this session I held up my hand fifty times to welcome a new member! The Association has energy and expectation on its side; and, however much may be averred to the contrary, a natural sentiment of rivalry with the chartered society stirs the heart and influences the spirit of the younger one. Backed by the press, ardent, and ambitious, the Architectural Association is aided by nearly all the Associates and some of the Fellows of the Institute. To read a paper, or attend the reading of one, to its members is equally a pleasure; and a roomful of eager and attentive listeners, with an unfettered press, is better payment to a competent lecturer than whole volumes of Transactions which, to parody a line of Pope,

"Are so corrected that they're ne'er correct."

Now a word in conclusion. However unfortunate was the tone of the Annual Report issued by the Council of last session, there was one sentence in it which deserves serious attention at the present moment. It was written:—"Only those conversant with the executive functions of a society can be aware of the marked divergence of opinions which exists on many questions respecting its policy and management." It is just this division, more apparent however than real, which forms the strength of the lukewarm office-holder, who holds the ready battledore to successive disputants and watches the good of the community tossed about like a shuttlecock—to fall eventually at his feet. Without a general acceptation of the very old policy of compromise, all discussion must inevitably be futile. Only by giving and taking in turn, can the Institute be pushed to do what, according to many of the younger members, it has not yet done,—"promote the advancement of a special art and maintain the integrity and protect the interests of those who practise it."

WILLIAM H. WHITE.

GREAT EXPANSION OF THE METROPOLIS.

THE new assessment of the metropolis which has just been made, and which comes into operation in April next, reveals some interesting facts and statistics as to the great increase in population and building which is going forward in every district within the metropolitan area, with the single exception of the City, where the number of inhabited houses is constantly decreasing, and their former occupants are migrating to suburban neighbourhoods. The figures show that the population in several of the great parishes on the northern, eastern, and western sides of the metropolis,—Marylebone, St. Pancras, Islington, and other places,—continues to increase, but it may, perhaps, be stated with confidence that it is south of the Thames where the greatest amount of building is going forward, and that what were within a very recent period purely suburban, or even agricultural districts, are now covered with miles of streets and houses, with a population only numbered by tens of thousands.

As regards the City of London, the returns show that the City proper contains 112 parishes and precincts, and that under the Valuation Act of 1869 its gross estimated value for assessment was 3,200,343*l.*, and its rateable value 2,681,235*l.*; but that in consequence of the removal of old houses for public improvements in large new buildings and new thoroughfares, the number of houses, and also the population, are continually decreasing, and that whilst at the census of 1861 the number of houses was 13,218, at the census of 1871 they had decreased to 9,248, and that at the latter date the population stood at 74,944, but is now considerably less. St. Pancras, although not covering so large an area as some of the other parishes within the metropolitan district, is, nevertheless, the most populous, its inhabitants reaching 230,000. Its area is 2,600 acres, and it is twenty-one miles and a half in circumference. The amount of its assessment is next to that of the City of London. Islington is also one of the largest parishes on the northern side of the metropolis, and one of those which is the most rapidly increasing in the number of its houses. At the last census it had 27,033 inhabited houses, and a population of 213,749, but since that date there have been a very large number of new dwellings erected, whilst others are still in progress, and it is now almost as large as St. Pancras.

Turning to the east, we find that Whitechapel, which comprises nine parishes, with the comparatively limited area of 406 acres, has, nevertheless, a closely-packed population of 76,332, contained in 8,313 houses, giving the large average of nine inhabitants to each house. The neighbouring parish of Bethnal-green is known to be one of the very poorest parishes in the metropolis. The census of 1871 showed the number of its inhabited houses to be 15,981, with a population of 120,200, or an average of eight inhabitants to each house, being thus almost as dense as White chapel.

Among the parishes at the West End it may be noticed that Paddington, covering an area of 1,235 acres, has a population of upwards of 100,000; and that the parish of St. Mary Abbotts, Kensington, at the last census, had a population of 120,234, but has since that time largely increased. The progress of Kensington has, indeed, been marvellous.

Crossing over to the Surrey side of the river, it is in the parishes of Camberwell and Lambeth respectively where the population is, perhaps, more rapidly increasing than in any other parts of the metropolis. With the exception of Lambeth, Camberwell is the largest single parish on the Surrey side of the metropolis. Its area is 3,420 acres, and its population, which, at the last census in 1871, was 111,302, had at the beginning of last year become increased by new buildings, to 130,000, and that number is known to have again very considerably increased by the large number of new houses erected in different parts of the parish during the year which has just closed. Within that period upwards of 300 houses have been erected on the plot of land known as the Rosemary Branch at Peckham, which was only recently laid out for building purposes, whilst from Loughborough Junction to Peckham, on both sides of the railway, which only about a year ago was nothing but green fields and meadow and park land, the whole of the area is being rapidly covered with dwellings. In the neighbourhood of Goose-green building is also rapidly going forward, the extensive old market-gardens between the Green and Champion Park having been purchased by the British Land Company, who have laid out the ground in streets, and on which some hundreds of houses have already been erected. Large numbers of houses of a high-class character are likewise in course of erection in the neighbourhood of Lordship-lane, Dulwich-grove, and other parts of Dulwich, whilst in the localities of Peckham-rye and Nunhead new blocks of buildings are rapidly springing up.

The same activity in building also applies to the large parish of Lambeth, one of the most extensive in the metropolis, and stretching from Westminster Bridge to the Crystal Palace. The area of this parish is nearly 4,000 acres, portions of which, near the river, as is well known, very densely populated, whilst a considerable area, extending in the direction of South Brixton, Streatham, and Norwood, is of a rural character. Its population at the census of 1871 was 208,342, but since that period it has enormously increased, and from the large number of new houses which have been erected in the parish since the census returns were made up, its present population is confidently believed to be upwards of 240,000. In proof of this it may be stated that during the last five years, the district surveyor for South Lambeth has passed upwards of 6,000 houses, which have been built, and the number erected during last year alone was 1,500. These new dwellings have been erected principally in the neighbourhoods of Brixton, Stockwell, Norwood, Clapham, and Wandsworth. In the last-named neighbourhood, Lavender-hill, at the upper end of Wandsworth-road, from the railway station to Clapham Junction, was a continuation of open fields only three years ago, and is now entirely covered with houses. The Bolingbroke Estate, between Wandsworth-common and Clapham Junction, and the vacant ground on the Battersea side of the Junction, as well as the district beyond, in the direction of Wandsworth, have all been covered with houses within the last three years.

WARRINGTON.

THE *New Post Office* has just been commenced. The building, which is to have a frontage of 47½ ft. towards Sankey-street, and 100 ft. towards Winmarleigh-street, will be of brick, with stone base mouldings, string-courses, and enrichments, the block at the Sankey-street end being two stories high, but about half the Winmarleigh-street portion only one story. The basement will be apportioned into a battery-room, clerks' and letter-carriers' retiring-rooms, with porters' kitchen and bedroom. The ground-floor will contain the public office looking both into Sankey and Winmarleigh streets, with entrance to the west corner. The postmaster's room will open out of the public office, and the sorters' room, which is 30 ft. by 38 ft., again out of it. On the first floor, with an entrance out of Sankey-street at the eastern corner of the building, and over the

public office and postmaster's room will be the telegraph offices, the stairs to which run at the back of the public office. The sorters' room, being one story high, is lighted both from the ridge and from windows looking into Winmarleigh-street, and has an entrance at the extreme end down this street. Mr. Williams, of Her Majesty's Office of Works, is the architect, and Mr. Collin has obtained the contract at the sum of 6,086*l.*

The *Conservative Club* in Academy-street has recently undergone considerable extension by the addition of two billiard-rooms and other premises. The principal billiard-room is 32 ft. by 29 ft., and has a raised platform, 5 ft. wide, running down one side, which will accommodate one or two sets of card-players, as well as those who take an interest in watching the progress of billiards. The roof is of open pitch-pine, stained and varnished. The room is lighted from the roof, and the heating is provided for by Haden's hot-air apparatus. The room is approached by an ante-room, part of which is partitioned off and fitted up as a lavatory. The adjoining room will have a larger superficial area than the room just described, inasmuch as it is an extension of a previously existing room. Its dimensions are 45 ft. by 23 ft. Mr. Wm. Owen is the architect; Mr. J. E. Wright, contractor; and the gasfittings and plumbing have been carried out by Mr. Hedgecock. The new building has cost 600*l.*

VALUE OF LAND, STOCKTON-ON-TEES.

IN June last, the Spring-gardens Estate, situate in Farm-lane, about half a mile from the market-place of the town, and belonging to the Ecclesiastical Commissioners, and used as a market garden, containing in the whole about four acres and a half, was put up for sale by public auction. Four years since the sum of 3,000*l.* would have been considered a large sum for this property, but the sale was opened by a bid of this amount from Mr. Adams, which rapidly ran up to 5,400*l.*, when the auctioneer, Mr. Thomas Hornby, declared the sale an open one. The biddings again commenced, and the property was ultimately knocked down to the bid of 6,825*l.*, made by Mr. Charles J. Adams, architect, on behalf of himself, Mr. J. W. Watson, and Mr. W. Adams, who were declared the purchasers. The property was purchased for possession in April, 1876, to be paid for in full in August last. Some delay having been occasioned in the completion of the deeds by the Commissioners, the payment was not completed until November last, when the tenant, having been compensated by the purchasers to give up possession at an earlier date, the purchasers have now taken possession, and a large staff of men are engaged felling the trees and constructing the sewers. The road-making will be started early in the present year. The proprietors have decided to engage their own workmen in order to find employment for a number of men who are out of work, and in the hope of alleviating some of the distress which is so great in the district. Three roads will be driven through the property, which has a frontage of about 500 ft., the plans for which have been submitted to the corporation and approved of by them. A portion of the ground has already been sold as laid out in sites, and it is contemplated to erect a church on a portion of the ground for a new district which has lately been formed.

THE ANCIENT WALLS AND FORTS OF SOUTHAMPTON.

THIS fine southern town possesses some of the finest examples of stone fortifications on the coast, and the Corporation have, with laudable zeal, from time to time taken steps to prevent their falling to decay. Not many years since they restored the Bar Gate, the ancient northern entrance to the town, and subsequently the old walls on the western shore and adjoining the west gate received at their hands the attention which all lovers of antiquity would desire. At the southern end of the town, near the Platform, stands a very ancient stone structure, for many years used as the jail; it adjoins the east gate. In fact, the latter is a portion of the building, which is about 60 ft. long and 20 ft. broad, and was originally flanked with two towers, one at the eastern and the other at the western end; the former one still remains in a tolerably good state of preservation, but the latter has for many years been dismantled. The Pier and Harbour Commissioners, who have possession of this building, are now restoring it and converting it into purposes of utility as well. The contract has been taken by Mr. Crook, of Southampton, and in the course of the restorations some old windows which had been filled up with rubble masonry had to be opened, disclosing the ancient traceried heads, the mullions being gone, the whole of which, with the other dressings, are in Tisbury stone.

The surveyor to the Board, Mr. Geddes, reported this to the Board, and we are pleased to hear that they ordered the complete restoration of these examples of Early English architecture, and we trust they will not be satisfied until the whole, including the western tower, have been completely restored.

THE THEORY OF LIGHT.

SIR,—It affords me a considerable degree of satisfaction to find that you speak approvingly on some of the important points of my "Revised Theory of Light." The first section, relating to the arts, whilst it contains some suggestions for the consideration of the scientific, is also addressed to the artist and the general reader; and in all works which attempt revision there must necessarily be much that is admitted in combination with what professes to be new.

Although I intended my title to be a modest one, it may not be sufficiently explicit as to the position I have ventured to assume in reference to the received theory of light: I therefore beg to state that I accept the undulatory theory as the true one, and the differentiation of vibration as the external cause of all the various *sensations* of light in us; and I push this accepted theory to its legitimate issues, in order to still further test its adequacy; or, in case the undulatory theory should prove vulnerable to new tests, to gain, perchance, some clue to the right solution of the problem.

That light in all its differentiations of colour has no existence whatever beyond the sentient, is not my assumption; it is a fundamental position assumed by the great thinkers. Neither Newton nor Huyghens supposed that light was in the one case inherent in the corpuscules which the former supposed were projected from the sun, nor in the other that light was a property of the undulating elastic medium itself. Each of these philosophers assumed only that his hypothetical mode of motion was the external cause of the various *sensations* of light in us. The believer in the undulatory theory cannot, indeed, for one moment, consistently attribute light to either the undulations themselves or to external things; for then the selfsame vibratory medium would possess the wonderful property of being of all colours at one and the same time; and if we find the vibration is the colour, the vibration is also the sound, and a simple mode of motion would be all kinds of things at once. Why a simple vibration should produce in one case sound, and in another light, will probably never be solved. The vibration, then, is not the colour itself, but is a sensation resulting from the contact of vibration and sentient.

Besides pushing the undulatory theory to its extreme consequences, I claim to have contributed an entirely new hypothesis, the libration of sensation, to account for the phenomena of the *ocular spectra*, an hypothesis which, while it appears most satisfactorily to account for these phenomena, links the human system with the solar, and shows that one simple law of compensation or restoration of balance reigns in both. That contribution to the theory of light will be of more value to the future than any picture, should I, sir, be either wise or conscientious to leave darkness, which I believe myself capable of making light, even to paint pictures as well as you are good enough to fancy I could. If the office of teacher and public benefactor be thankless, that is not my fault.

W. CAVE THOMAS.

THE THEORY OF COLOUR.

MR. BENSON would fain have had us believe that "green" was a "primary colour," and now Mr. W. Cave Thomas, in his "Revised Theory of Light," asserts that there are no such colours as "primaries" at all, except in point of time or succession. I suppose next we shall be asked to believe that *colour* does not exist at all, that it is simply a "sensation" of our own imagination. But with all due respect for Mr. Thomas's very subtle and profound reasoning, I am convinced, from continual observation, of one fact—and that is, that green is a *compound* colour. That it is always formed, whether in nature or in the mixing of pigments, of two or more colours, or "sensations," or whatever else they may be termed. That all nature, throughout which we see such a beautiful and wonderful variety of "greens," would unquestionably present to our eyes the "sensation" of yellow—from a sickly whitish one to a deep orange yellow—if it were not for the blue, the actinic, or chemical ray in the atmosphere—the ray of moisture, if I may so call it, which acts upon and enters chemically into combination with the yellow sap of plants and trees, and alters it to ever-varying shades of green. On the contrary, if it were not for the inherent colour of the sap of plants all nature would be blue instead of green.

Green is thus formed by the mixing, or amalgamation, or the action of one colour upon another; and this combined process conveys to our eyes the "sensation," which we all know and recognise as the colour of green. No matter how you describe it, or what you may call it, it is formed by a double process, and by two or more distinct colours. Like everything in nature, when clearly understood, the combination is of the most simple character. What is true of a little gamboge added to a little indigo, is true throughout nature, even to the refraction of light at sunrise or sunset, when we often see the blue sky near the horizon, changed to the most lovely green, formed simply by the yellow light from the sun amalgamating with or shooting through the blue sky. This compound character of green is a simple fact in nature, and cannot possibly be got rid of by any amount of reasoning.

JAMES K. COLLING.

NEW PUBLIC HALL AT HUNTLY, N.B.

THE new public hall and municipal buildings for the burgh of Huntly have just been completed and opened. The new building is in the Scottish Baronial style, the principal architectural feature being the tower, which rises over the front elevation to a height of 80 ft. The frontage of the building to Gordon-street is 64 ft. 6 in. The front of the building to the height of the first floor is in polished freestone, and above that the walls have freestone dressings, filled in with granite ashlar. The freestone is from Rhynie quarries, and the granite from Syllavithy quarries on the Castle Forbes estate, near Bridge of Alford, the colours of the stones presenting a pleasing contrast. The tower rises as a continuation of the front wall to the height of about 58 ft.; and above the parapet of the façade of the building is in three divisions, the two lower having windows, and the upper circular spaces for clock dials. The roof of the tower gradually contracts till it terminates in a platform about 5 ft. square, inclosed with ornamental iron-railing with corner vanes. A flagstaff rises from the centre of the platform to a height of 22 ft. The tower at the base is 15 ft. square, is fitted up inside into three floors, having also a gallery for bell and clock with four dials. The two shops in the front of the building are 22 ft. wide by 24 ft. deep. The main entrance to the building is from Gordon-street. It opens into an outer lobby, 10½ ft. square, beyond which there is a doorway admitting into an entrance-hall or corridor. The corridor measures 26 ft. by 13 ft., the ceiling is at a height of about 12 ft. From the entrance-hall or corridor there is a broad staircase leading to the apartments in the first floor above the shops. The principal of these apartments is a public meeting-room, 23 ft. by 24 ft., and having a height from floor to ceiling of 14 ft. Adjoining this apartment there is a dressing or cloak-room, about 10 ft. square, with ante-room about 13 ft. by 11 ft.; and closet with lavatory, &c. There are also upon the first floor three apartments for residence to the keepers of the building. These portions of the building are contained in the block fronting the street, measuring 64 ft. by 42 ft. The public hall stretches backward from this block, and occupies an external space of 80 ft. in length and 45 ft. in breadth. Externally, the side walls of the hall are 25 ft. high, while the apex of the roof is at a height of 40 ft. The public hall will seat 600 people. The floor is on the ground level, and has an area of 65 ft. by 41 ft. The hall is entered from the corridor, from which there is one opening into Gordon-street, and another into the passage by the side of the building. At the back end of the hall there is a circular recess, which is filled by a permanent platform, standing 3½ ft. above the level of the hall floor, and having a

width of about 20 ft. The height from the floor to the ceiling is 25 ft.; and the roof is broken up into nine panels by massive mouldings, the angles of the ceiling and side walls being coved, the circles springing from a bold cornice. The side walls are lined with pitch pine varnished, to a height of 5 ft., and above that they are lathed and plastered. The hall is lighted by five windows in each side wall. Doors open from each side of the platform, and also from the body of the hall in the vicinity of the platform, into retiring-rooms. The erection has occupied over eighteen months, work having been commenced in May, 1874. Local workmen were mostly employed, and the contractors for the different branches were:—Messrs. Ingram & Gordon, masons, Huntly; Mr. Milne, carpenter, Inverurie; Barclay & Duncan, slaters, Huntly; Logie, plasterer, Huntly; Bowman, plumber, Huntly; and Robertson, painter and glazier, Huntly. The cost of the building and furnishings will be slightly over 3,000*l.* The architect is Mr. James Anderson, of Huntly, whose plans were selected in a limited competition by the trustees of the late Mr. Alexander Stewart, jun., who by will directed the realisation of his estate, the proceeds to be devoted to the erection and maintenance of a public hall for the burgh.

TREATMENT OF AN ARCHITECT IN THE ISLE OF MAN.

SIR,—Permit me through your columns to place before professional men generally a matter most injuriously affecting all our rights; and in order that it may be properly understood, I will, with your permission, briefly give a few facts of the case, and then allow the correspondence to speak for itself.

In the years 1869-70, from an intimate acquaintance with Douglas, and without the slightest aid from any one else, I first prepared the plans for the embankment now carried out, and gave it the name "Loch Parade," the production of which caused the general question of town improvements to be taken up for the first time. Within a few months after my plans had been made public, several others were produced by local men, and an extraordinary amount of public excitement attended the matter. A referee was called in, as it was thought, to decide as to the best of the plans submitted; but it resulted only in the gentleman alluded to issuing one in his own name, so like, as practically to be the same as one of those on which he was called to report (the work of an amateur). This result not being satisfactory to the public, the latter plan, bearing the referee's name, took the place of that belonging to the amateur alluded to, was placed in competition with the others, and three professional referees chosen to decide between them; the House of Keys afterwards appointing a committee of its own members also to report thereon. The result was that my plan was accepted by referees and committee both, and adopted unanimously by the Insular Legislature, "The Douglas Streets Improvement Act, 1874," being passed for the purpose of carrying it out. Success attended my efforts after a four years' struggle, at an expenditure of time and money I scarcely care to recall, and after an opposition the bitterness of which I shall never forget; but, bitter as it was, not one whisper arose as to my authorship of the plan.

I now innocently thought my troubles were over, and I should have nothing to do but carry out my pet scheme, which had at last secured that success so dear to professional men; but found myself, without reason assigned, or to my knowledge existing, superseded by the appointment of Mr. Powell to carry out the distinguishing feature of my plan (although requiring nothing beyond the experience of a practice such as my own), and the prestige thereof, as well as the commission on works worth 20,000*l.*, sought to be taken from me, Mr. Powell's only connexion with the matter previously being that of a witness, for an hour or so, before the Court, during the inquiries above referred to.

My plans being proceeded with, and no arrangements whatever made with me, I wrote the Improvement Board, most respectfully, as to my position being defined, receiving a reply, which, although signed by the secretary, I learned had been written by the Board's legal adviser. This led to correspondence between the solicitors on both sides, extending over some months, and resulting in my appointment of architect and surveyor to the Board, with arrangements only as to future work, all the past being left in abeyance by mutual understanding. My duties, however, up to the act of which I complain, were almost *nil*, surveying of building land, laying out of lots, opening up of streets, reports on various matters, evidence as to value of property taken before referees appointed under the Act, all being done by local men, regardless of my official position.

The climax of the treatment to which I, as the author of the scheme, have been subjected, was reserved for the completion of that part of my plan placed in the hands of Mr. Powell, the resident engineer to the harbour works, when, although the vice-president of the Board publicly speaking of the "Loch Parade," said,—"The result is, that if the land sell—and, judging by the inquiries there are already, there can be no doubt about that—then we shall have accomplished this great work, than which there is no finer in the kingdom, without a single penny cost to the town,"—my name was entirely omitted from a public document officially said to contain "the name of the engineer and others connected with this important work," regardless alike of the facts before stated, and my now holding the position of architect and surveyor to the Board, and on that account only entitled to equal recognition with the engineer (supposing him even to have done more than carry out the works of another).

Although the Board (in writing) put upon Mr. Powell the responsibility of an act so mean, I still thought it but courteous to give him an opportunity of clearing himself; but as, instead of doing so, he simply tries to evade the question by declining to do what he was not asked, he leaves himself committed to an act which to characterise truthfully would be offensive.

This being the act of a public body in connexion with a public work, would, if allowed to become a precedent, seriously affect the rights of all professional men; I have, therefore, felt it to be my duty to protest, and now bring the matter to the knowledge of my professional brethren, feeling confident I shall have their sympathy in this struggle for our common rights.

C. O. ELLISON, F.R.I.B.A.,
Vice-President of the Liverpool Architectural Society.

CONVEYANCE OF BUILDING LAND.

HUNTON *v.* GREY AND OTHERS.

THIS case in the High Court of Justice, Chancery Division, before the Master of the Rolls, is one of considerable importance to builders and others contracting for the sale of land. The plaintiff sought to obtain specific performance of an agreement by the defendants to sell him some copyhold land for building purposes.

On the 24th July, 1873, the defendants, through their agent, Mr. Dodds, M.P., and with the consent of the person beneficially in possession of the rents, agreed to sell the land in question. A covenant was contained in the agreement to the effect that the purchaser should erect a dwelling-house, with a lodge and suitable outbuilding on the purchased property. That he should expend no less than 1,000*l.* in the erection of the dwelling-house, and should have the plans and elevations of the same previously submitted to, and approved of, by the vendors or their agent. The purchase-money was to be 910*l.* 3s., and the contract was to be completed on or before October, 1873. Prior to the date of the contract the defendants agreed to sell to a Mr. Smith a plot adjoining the plaintiff's purchase. It was complained by the plaintiff that Mr. Smith had placed a waterspout so as to be a trespass on his land. In September, 1873, the plaintiff agreed to the defendant's offer to enfranchise the land, and about the same time the plaintiff commenced the erection of his house, and had laid out about 3,000*l.* on it. He alleged, in his Chancery bill, that his plans had then been submitted to, and approved of by, Mr. Dodds, the defendant's agent. This statement was, however, denied by the defendants. The plaintiff had sent the draft conveyance to Mr. Dodd's office, but the defendants had declined to execute it until the question at issue between Mr. Smith and the plaintiff as to the boundaries had been settled, and the plans approved. The plaintiff now filed this bill asking for specific performance and the costs of the suit.

For the defendants it was urged that they were justified in refusing to convey the property to the plaintiff, inasmuch as he asked them to assure to him land already contracted to be sold to another party. The alleged approval of plans, they said, did not take place. The day after the plans were left at Mr. Dodd's office plaintiff met the defendants' architect in the streets, who said he thought they were very "nice." This "nice," it was contended, did not amount to the approval required by the contract.

The Master of the Rolls observed there was no dispute about the contract, and the defendants were bound to execute a conveyance, according to the covenant in the agreement. They refused, however, to execute until the squabble as to the boundaries was settled. Anything more absurd he, the Master of the Rolls, had seldom seen. The defendants had nothing to do but to take the purchase-money and convey, according to the provisions of the contract. With reference to the other point, the learned judge thought the defendants were right in insisting that no approval of the plans had ever taken place. Both sides had been wrong and "wrong-headed," and he should, therefore, give costs to neither side. A conveyance would be executed, and there would be interest on the purchase-money at 5 per cent.

An array of counsel were engaged, and the litigation will have cost a considerable sum.

"GRINDING-MONEY" AGAIN.

SYMES *v.* MORELAND.

IN this case, heard at the Clerkenwell County Court on the 17th ult., before Mr. Gordon Whitbread, the judge, a claim was made by the plaintiff, a carpenter and joiner, against Messrs. Moreland & Nixon, builders, of Old-street, St. Luke's, for the sum of 9d., being an hour's pay in lieu of notice, for time to grind his tools. Mr. Wakeling appeared for the plaintiff, and Mr. Nixon for the defendants.

Mr. Wakeling stated that the claim was for 9d., but it was a large question whether the plaintiff was entitled to what was called in the trade "grinding-money." Previous to July, 1859, it was the custom to allow grinding-money, in order that when workmen went to their next place their tools might be in proper order, and for that purpose two hours and a half were allowed. The masters and the representatives of the workmen, in July, 1875, had a meeting, at which it was agreed that not exceeding two hours should be allowed for grinding-money.

The Judge remarked that the meeting would be in the teeth of any custom, for, if it was the custom, there would be no occasion for the meeting.

Joseph Symes, the plaintiff, said he was a carpenter and joiner, and had been in the trade for forty years, ever since he was a boy. It was formerly the custom of the trade to allow two hours and a half for grinding tools, or a quarter of a day; it was now the custom to allow two hours, not in some cases, but generally. He was discharged on account of the slackness of the work; he had notice at eleven o'clock, and should have had the notice at ten o'clock to leave at twelve. Was not aware that some of the largest firms only allowed one hour to the men for putting their tools in proper order.

Joseph Coles, carpenter, gave evidence of the custom being to allow two hours to put the tools in order.

Mr. Nixon, one of the defendants, said he had been in business for fourteen years, and had worked for twenty years. The joiner had never been allowed more than an hour for putting the tools in order. He was not consulted as to the meeting of the trade, nor did he belong to any association. He had notice put up in the shop of one hour being allowed for grinding-money, but it had been torn down. The men had a number of tools, but they could grind them in one hour, for it was supposed they would always be in working order to do the work, and they would not, therefore, all be required to be ground. At Messrs. Cubitt's, Gray's-inn-road, and some other shops, two hours were allowed for grinding tools. He had between 200 and 300 men in his employ, and about twenty or thirty had been discharged, but he had had only two disputes, one of them being the present case.

George Shapley, foreman to the defendants, said he engaged the men. The plaintiff came and asked if they had a job, and he engaged him. Nothing was said about grinding-money being paid. Two of the men were discharged at the same time, eleven o'clock, and another came in at twelve o'clock, and then received notice. The rule of the shop was to allow one hour for grinding-money.

The Judge considered the evidence as to the custom to be very slight. The meeting of the trade showed that there was a difference, and the two associations came to a resolution that not exceeding two hours should be allowed for grinding-money, but that did not establish the custom that two hours should be allowed in every case. It only said that not more than two hours should be allowed.

Judgment for defendants.

ASSESSMENT OF A SAW MILL.

NORTON & SONS, APPELLANTS: THE ASSESSMENT COMMITTEE OF ISLINGTON, RESPONDENTS.

THE appellants (at the Islington Special Assessment Sessions) are timber merchants and proprietors of a saw-mill, occupying wharf property on the Regent's Canal, in the parish of Islington. The assessors and overseers of the parish had originally fixed the value of the property in the new assessment list, which is to come into force next Lady-day, at 700*l.* gross value. This figure upon appeal before the Assessment Committee was reduced to 600*l.* gross value, and it was against this reduced amount that Messrs. Norton & Sons appealed to the Special Assessment Sessions.

Mr. Robert Walker and Mr. Wagstaff, surveyors, called by the appellants, valued the premises at 400*l.* per annum gross value, deducting another 100*l.* for repairs, leaving the rateable value at 300*l.*

On the part of the Assessment Committee, Mr. Higgins and Mr. Clark, surveyors of the Vestry, were called, who placed the value at 1,000*l.* per annum gross; whilst Mr. Worthington, surveyor, placed it somewhat higher. Mr. Arthur Harston, of the firm of A. & C. Harston, surveyors, placed the gross value at 800*l.*, exclusive of the fixed machinery, and placing the property in class eleven, deducting 60*l.* for repairs, &c., leaving a rateable value of 740*l.* The machinery did not appear to have been generally rated in the parish; but if the fixed machinery in this case were to be taken into consideration, then, in his opinion, the gross value should be 1,060*l.*, and the rateable value 878*l.*

The Court, after retiring to consult, confirmed the rating, but made no order as to costs.

HEATING WITH HOT WATER.

SIR,—I HAVE somewhat foolishly attached a coil, for warming a hall, to the hot-water apparatus for warming water for bath, taps, &c., over the house. The water of the whole system was spoiled by the rust of the inside of the coil and iron pipes thereof (lead pipes being used for all the rest), but is now apparently clearing, after a week or so of use. The coil warms moderately well, but what I much wish to know is,—1st, Will the inside of the coil and its pipes gather fresh rust when left full of water, but cut off from the general circulation, when the coil is not being worked (as it will be)? And, 2nd, The best method of treating such a combination so as best to escape rusty water everywhere?

C. H. F.

"RINK."

SIR,—I append a cutting from the *World* newspaper, which may be of interest in connexion with the controversy now going on in your columns as to the word "rink." The writer in the *World* says:—

"The following 'Poem picked up at Prince's,' though in truth it has but little poetry in it, shows how quickly a just retribution will sometimes overtake rash young gentlemen who attempt to take liberties with the English language during a 'cruise upon wheels':—

'There is rank on the rink,' said young Brown, with a wink;
People stared, and they thought he was drunk;
On the rink, then, he rank, and came down with a spank,
Sincerely repenting he'd runk."

D.

The Ordnance Survey.—It is said that the Government has ordered that the annual cost of the Ordnance Survey of the United Kingdom shall be reduced, and that on Saturday and Monday last a large number of civil assistants at the head-quarters in Southampton received their discharge.

THE PUBLIC RECORDS.

A VAST amount of valuable work is going on quietly in the Public Record Office, where the historical documents of the kingdom are being systematically arranged, and the more important among them reproduced in a modern form accessible to everybody. The principal works, to the production of which the energies of the department are now devoted, are the Chronicles and Memorials of Great Britain and Ireland during the Middle Ages. The first three volumes have been completed and published, including the "Memorials of Saint Dunstan, archbishop of Canterbury"; while seventeen further volumes are in the press—if not by this time published—and three others in progress. The varied interest and value of these works will be indicated by the following selections from the list:—"Life of Thomas à Becket, from an Icelandic Saga, with an English Translation"; "Register of Malmesbury Abbey"; "The Metrical Chronicle of Robert of Gloucester"; "The Historical Works of Ralph de Diceto, dean of St. Paul's, 1181–1210," &c.

The popularity of the work is evidenced by the fact that the sales had, up to the beginning of the year, amounted to 28,907 volumes.

M. Armand Baschet has, at the request of Lord Romilly, prepared a list of documents relating to English affairs preserved among the French archives; and, according to his report on the subject, some very valuable additions will be made to our historical papers if copies of the French originals can be accurately obtained.

But the existing records relating to the history of our country are already of immense value, and the references which are made to them in the Annual Reports of the Public Record Office, though, of course, not touching on a tithe of the actual documents, are most interesting. From the list of the Welsh Records of the Palatinate of Chester, for instance, we can gather many facts which throw great light on the customs of the period to which they refer. In 1407, for instance, we have the appointment of John de Acton and others, as admiral and governors of the fleet fitted out by the mayor and citizens of Chester, and about to proceed to sea on the king's service. The value of land is shown in the Indenture, dated 1366, by which Edward, Prince of Wales, grants to the dean and chapter of St. Asaph a piece of land called Gronantesmore, for the yearly rent of twenty marks, and promises to allow them 12d. yearly for every acre destroyed, should the sea burst over the land.

In 1391 we have an indenture between the bishop, dean, and chapter of St. Asaph's Cathedral and Robert Fagan, the said Fagan to build and complete the belfry of the cathedral in stone, to the height of 5 rods, and 1½ rod of battlement, the said chapter to pay to the said Robert 100 marks, "*sc'd'm quantitatem facture d'ci campanilis*," and to find carriage for the stone and lime; the work to be completed by the Feast of All Saints, 1392.

The principle of arbitration, recently paraded as a modern idea, was not unknown to the Welshmen of 500 years ago; for among various similar documents we find a recognisance for 1,000 marks on the part of Richard de Aston, Kt., and others that the said Richard de Aston abide the award of John de Burghes, and three other arbitrators, touching all dissensions between him and John de Mascy of Podyington, Kt.; and there is a counter recognisance on the part of John de Mascy of Podgington. These worthy people had a more business-like way of insuring the acceptance by both parties of the arbitrators' award than is adopted nowadays, when, in disputes between colliers and colliery owners, there is no assurance that the former will abide by any decision that is adverse to their claims.

Lead mines in Flint, and elsewhere in North Wales, are recorded as having been let in 1389 at a yearly rental of 40*l*.

Considering the frequent allusions we have made to the paltry salaries offered to surveyors at the present day, the following announcement, notwithstanding the difference in the value of money, would seem as applicable to the end of the nineteenth as to the beginning of the fifteenth century. "Robert de Baildon, appointed Sept. 22, 1402, keeper and surveyor of stores in the castles of Conway and Carnarvon, and surveyor of the works of the town and castle of Conway, with 6d. a day wages." Immediately prior to this Thomas Bagylegh, who had been with the king's father at the siege of Calais, and at the battle of Poitiers, and elsewhere abroad, and had never received any reward, as was well known to the people of Chester, had been allowed a similar sum—6d. a day "during pleasure." Certainly Thomas Horlebot, of the principality of Chester, thought it worth while to petition the king for 1d. a day, he being feeble and poor, and a grant was accordingly made to him of this magnificent sum. But this surveyor was not so well treated as William de Hampton, who in 1399 was appointed plumber to the castles of "Chester, Beston, Flint, Rothelan, Conway, Beaumarres, Caernarvon, Crukyth, and Hardelagh," for life, with 8d. a day for himself, and 4d. for his man.

We find the germ of modern "paving rates" in the grant of "murage" for the repair of the walls and pavements of the city of Chester, which in 1395 were, according to the mayor and commonalty, in a very ruinous state, and had from the earliest times been supported and repaired by a murage. This "murage" had, in 1387, been diverted from its legitimate use to the "rebuilding of the bridge there, the destruction of which caused the inhabitants and those resorting to the said city much danger and inconvenience, and was a source of great loss."

To the riots and rebellions of the times there are ample references, which resulted in such grants as the following, dated 1364:—Licence to John de Delves, Kt., to fortify and kernellate his mansion at Dodynton, with stone, chalk, and wood, and to hold the same so fortified to himself and his heirs.

The ancient forestal rights of the Crown gave rise to writs, such as that calling upon the forester to "expel all dogs, *canes molosorum*, and pigs from the forest (Delamere), the game in which was much injured by the coursing of the former, and the grubbing up of the latter"; and "to build *quandam cameram* in the said forest, 40 ft. long and 20 ft. broad, and two stories high, for the convenience of the foresters, the Prince having been informed that great damage had accrued to the vert and venison of the forest, owing to the distance from it of the foresters' dwellings."

Here is a curious entry:—"Oct. 26, 1352.—Pardon to Thomas de Beeston and Katherine his wife, for the trespass which Elizabeth, who was the wife of Robert de Calvilegh, committed in marrying herself." In these days of "women's rights," a woman hardly requires a Royal pardon when she commits the "trespass" of getting married; much less do her parents and guardians, even though, as in this case, the marriage transfers to the husband the right to landed property.

Fac-similes of the most valuable national manuscripts are being made by means of the photo-zincographic process. Irish history is being first dealt with, and the second volume of the series, containing seventy-nine *fac-similes*, has been produced. As one of the most characteristic of these documents, we quote the following description of one of the later papers, dated June, 1542. The original of this is in English; but Gaelic, French, and Latin originals all figure in the book. The document referred to is a petition from the gentlemen, inheritors, and freeholders, of the county of Tipperary to the king, giving an account of the prosperous state of the county, formerly under the governance of the Earls of Ormonde, until the delegation of his authority by James, the White Earl of Ormonde, to some of his kinsmen during his absence in England at the court of Henry VI.

It particularly complains of the action of one Sir Edmund Butler, and his brother, Sir James, who kept continually charging the county with coin and livery, coddies, coyssers, hounds, hunts, stud-keepers, masons, carpenters, and other workmen, to its utter impoverishment. His son and heir, Sir Thomas, followed in the evil steps of his father, and "swearing that he will forego nothing of what his father and grandfather extorted from the complainants, makes such intolerable exactions from them, plundering them of their goods and money, and making them keep his studs of horses, and his hounds of many kinds, obliging them to maintain horses and horsemen for his service and garrisons for his castles, and to keep them and all his mills, gardens, orchards, etc., in proper repair. Every Christmas he makes them pay him 7*l*. 13*s*. 4*d*. for wines which he orders for that feast, and he also makes them pay for the carriage of all the corn, wine, pails of butter, and anything else he chooses to order. On the marriage of each of his daughters, he takes a sheep from every flock, and one cow out of every sixty, besides assessing them in many other unlawful ways, whereby they are so impoverished as to be unable to pay his Majesty's subsidy." They therefore humbly pray redress.

This document, says Mr. Sanders, in his report on the subject, "furnishes a very graphic picture of the wretched state to which Ireland had by that time been reduced, not so much by her original Celtic inhabitants, the *puri Hibernici*, the 'wild Irish,' as by the mixed race that had sprung from inter-marriage of the native princes with the descendants of the Anglo-Norman nobles that had followed De Clare,—a race that, after the manner of most half-castes, often inherited the worst qualities of each parent stock. It also sets out some of the many modes by which the inhabitants were oppressed, and the country impoverished by the vagaries of these Anglo-Norman-Irish robber chiefs,—'coin and livery,' which meant the forced provision for three or four nights at a time for the chief's soldiery, and a presentation to them of a sum of money into the bargain,—'foy and pay and mertyeght,' or forced contributions of cash and kind towards the entertainment of all his guests, whenever he had any (and he was generally of a very hospitable turn),—'musteroons,' for the keep of all his workmen, from the mason who repaired his castle to the tailor who made his clothes; and 'cody and coshry,' an arrangement by which he contrived to get rid of another considerable item of personal and household expense by periodical visits, with as many of his respectable retainers as he chose to take with him, to his tenants, who were not only obliged to keep the whole party in meat and drink, light and lodging, but fee them with money at their departure. If a tenant was at all disagreeable, his lord repeated his visit till he was ruined. As will be seen in this petition, the petitioners were sessed in every shape and way, and the assessors in such cases were often so insolent and rapacious that unless bribed they would pay themselves by seizing more than they had to account for."

HOW TO RAISE THE STANDARD OF INTELLIGENCE AND EDUCATION IN THE BUILDING TRADE.

SIR,—The grave importance of the scheme, so opportunely advocated in your columns by Mr. Morris, demands the prompt attention and earnest co-operation of all connected with the building trade. The general purport of the scheme I heartily applaud, but beg to differ in the mode of procedure. I should certainly recommend a far more liberal programme, a much broader footing, or, it is greatly to be feared that the superstructure proposed to be raised thereon would be far from imposing,—would speedily collapse and crumble into insignificance. I can scarcely concur that it is the thoughtful workman that is surprised at this wide-spread ignorance of bricklayers, for he must certainly be cognisant of the fact that the ma ity are self-made men. The smart labourer is not slow to observe how very few tools, and what a slender stock of knowledge, is required to perform the ordinary kind of work; he aspires (and why should he not?), speculates in a trowel and pair of lines, and after sundry tactics, tips, &c., he speedily attains the highest pinnacle of his ambition, and emerges from the menial obscurity of the mortar-bank a full-blown bricklayer. Here, unfortunately, he comes to a dead stand, sinks into a kind of hopeless, helpless metamorphic state, being perfectly satisfied with the return of Saturday night and its demoralising accompaniment,—an unlimited supply of beer. Raise, then, the standard of intelligence of skilled workmen, and these men with these habits cannot hope for success. The schoolmaster must be visited as the preliminary step to advancement. I do not wish to infer that bricklayers are the only class of men that require the aid of the schoolmaster and their more enlightened brethren; multitudes are to be found in the joiners' shop and at the mason's banker. I may go much further without exceeding the truth one iota; there are many foremen, and even clerks of works, who are so sadly deficient even in primary knowledge such as that possessed by the ordinary schoolboy of ten years old, that their thoughts or ideas when transmitted to paper bear a striking resemblance to some of the most ancient systems of hieroglyphics. Even the intelligent and skilful workman is not such as he should be, inclined to pamper ease, persuading himself that this or that problem may never fall to his lot to solve in a practical manner. He rests in ease and fails in the time of trial.

Seeing, then, that all need improvement, a

united and Herculean effort must be made; reform and self-denial are an absolute necessity; lodges must not be held at public-houses,—malt and hops will not assimilate with geometry and geometrical projection; the business and trivial matters connected with the different lodges, hitherto crawled through in three or four dreary and profitless hours, should be handled in a business-like manner, and accomplished in at least one quarter that time, and the grand product of these fragments of a man's existence should be utilised in the mental development of those who are sufficiently wise to see their own ignorance.

The course of study should embrace a fair knowledge of the ordinary rules of arithmetic, including, of course, vulgar and decimal fractions familiarity with the rules of proportion, some of the most useful of the problems in the mensuration of superficies and solids, geometrical and isometrical projection, divested of those multitudinous laws, rules, theorems, and axioms, which so damp the ardour of any ordinary man.

In due course examinations should be held and certificates should be granted, and that ultimately the holders of the higher class of these certificates should be formed into a society that might be termed "The Institute of British Mechanics (Building)," similar in design and purpose to the Institution of Civil Engineers, and plans should be laid down, papers should be read (not necessarily by the senior members), alternately by the different trades at their respective lodges and all trades should be free to attend upon the production of a member's pass.

Probably I may be regarded as sanguine, and aiming at a Utopian state of felicity. It is certainly within the bounds of possibility that I may be so: time and a proper ventilation of the subject alone can prove. I should therefore propose that the matter be discussed at the different lodges, a general meeting convened, a committee selected, who should have power to lay down a plan of action. I should be most happy to co-operate for the advancement of technical education.

T. MARCUS HOUGHTON, Foreman.

WESTMINSTER AQUARIUM.

CAN you inform me, sir, if any accommodation is to be offered to the Fellows at the opening ceremony on the 22nd? Having paid a heavy entrance-fee for the privileges of fellowship, I expect something more than is at present known. At least, a place to sit down on during the above ceremony ought to be one of the privileges, but which, I hear a whisper, will not be the case; and, according to present arrangement, very little chance of even standing. A disturbance ought to be provided against. A FELLOW.

THE ALBERT STARCH WORKS, PAISLEY.

PAISLEY is noted for its starch works, and boasts some of the largest manufactories of this kind in the kingdom. The Albert works, erected by Messrs. Foulds, Gilmour, & Co., in Murray-street, and which have been in progress for about two years, are now nearly completed, and will add another to the list already existing. The designs for the new buildings have been prepared by Messrs. Rennison & Scott, architects, and the estimated cost is about 20,000*l*. The Albert works have a frontage of about 145 ft., and run a considerable distance northwards from Murray-street. On the ground flat is the "tun-room," 275 ft. long by 43 ft. wide, on each side of which are arranged a large number of "tuns" or vessels for depositing the manufactured article, and each of which is capable of containing between four and five tuns of starch. In addition there are departments for the manufacture of feeding-meal for cattle; the packing-rooms and grinding-houses, all 67 ft. long, with stoves specially fitted up for the manufacture and preparation of corn-flour, and crisp and crystal starches, each of these stoves being 100 ft. long. The store-room is situate on the top or fourth story of the building, and the grain and other articles used in the various processes of manufacture are received on the ground flat, and hoisted upwards by steam-cranes. In undergoing the requisite transformation these various elements descend by a sort of filtering process from flat to flat, the result of which is a considerable saving of manual labour. The necessary machinery has been fitted in the boiler and engine rooms by Messrs. Wm. M'Ghee & Sons, engineers, and by Messrs. Fullerton, Hodgart, & Barclay; and, as the result of tests, has been found admirably adapted to the purpose intended.

PROPOSED NEW PUBLIC BUILDINGS IN EDINBURGH.

AT a meeting of the Lord Provost's Committee, held on the 22nd ult., the subject of a new town-hall and public buildings, as remitted from a previous meeting of the Council, was under consideration. Several sites in the New Town were mentioned and discussed, and ultimately a sub-committee was appointed to obtain information in regard to the whole matter, and report. The Lord Provost, it is stated, was of opinion that the cost of erecting suitable public buildings, including a large city-hall, in a style worthy of Edinburgh, would amount to about 250,000*l*.

THE PROPOSED CHANNEL TUNNEL.

THE whole of the correspondence which has passed between our Foreign Office, the Board of Trade, and the French Government, respecting the proposed Channel Tunnel and Railway to France, has just been published in the form of a Blue Book, and forms a very interesting contribution to the early history of this project. The letters range in date between the 16th of October, 1874, and the 6th of August, 1875, and the publication of them is greatly enhanced in value by the addition of lithographed plans and maps, illustrating the soundings and other preliminary surveys necessary for a proper comprehension of such a gigantic scheme.

THE STRENGTH OF STRUCTURES.

AT the last meeting of the Glasgow Institution of Engineers and Shipbuilders, Professor James Thomson, C.E., read a paper bearing the title "Comparisons of similar Structures as to Strength, Elasticity, and Stability." In the course of his paper the Professor furnished certain easily-comprehended but exhaustive data for estimating a comparison of similar structures of different sizes as to strength, elasticity, and stability. He explained how, in structures of similar forms, but varying in size, though subjected to similar strains, the margin of superabundant strength decreases as the dimensions increase, till the enlarging of already large structures must cease, by a stage being reached at which they must fail under the load of their own weight. Large tubular bridges and ships furnished cases in point. In certain other structures, on the other hand, such as obelisks, pinnacles, and chimney-stalks, which depended for their resistance to the overturning tendency of the wind on the action of gravity, the increase of the force of wind per square foot which they would bear was in proportion to the increase of their linear dimensions.

ENLARGEMENT OF THE ROYAL INFIRMARY, WATERLOO ROAD.

THE Royal Infirmary for Women and Children, Waterloo-road, founded by the Duke of Kent in the year 1810, has for some time past been undergoing a considerable enlargement, and the works which are now completed will admit of greatly increased accommodation both for indoor and outdoor patients. The external features of the building have been materially changed and much improved by the erection of an additional story, in which there is space for twenty-two beds beyond those which the capacity of the building was equal to before the enlargement. The added story is 20 ft. in height, making the present extreme height of the Waterloo frontage 52 ft. The general architectural features of the old building have been adhered to, and the windows of the new portion have arched heads uniform with the other parts of the structure. The elevation is surmounted by a parapet-wall 4 ft. 6 in. in height on each side, and 5 ft. 6 in. in the centre, on which are inscribed the names of the Queen and the Prince of Wales as patrons of the institution. The materials used are Malm brick, with ganged arches, the cornice being in Portland cement, and the strings and copings in Portland stone. The open casements of the central portico entrance have also been filled in, for the purpose of giving greater protection in unfavourable weather to patients and others who may be in waiting. Several important structural alterations have likewise been made in the interior of the building. These include the basement, which has been entirely reconstructed, with the view of giving increased accommodation for the out-patient department, and lifts have also been constructed from the kitchen to the new upper story, for the purpose of carrying up the patients' food.

Mr. E. M. Barry, R.A., designed the alterations and additions, which have been carried out by Mr. W. Brass, the contractor, at an outlay of nearly 5,000*l*.

SCHOOL BOARD SCHOOLS.

Rillington (E.R. Yorkshire).—The new Board School in this village was opened on December 22nd; it consists of school-room, class-room, with ample entrances, separate offices, and large play-grounds, and affords accommodation for 140 scholars. The style is Gothic, and the materials used are common gray clamp bricks for the walling, with red pressed stocks for the bands, arches, and diapers, walled in black mortar. Specially moulded bricks have been used in plinths, strings, and labels. The sills, copings, roof, corbels, &c., are of cleansed moorstone. The roofs are covered with blue and green slates arranged in bands, and the ridges and finials are of red terra-cotta. Internally the principal roof timbers are dressed and varnished, and the walls are lined to a height of 4 ft. with red stock bricks walled with fine joint. The work has been substantially and satisfactorily carried out by local contractors at a cost, including boundary walls, palisading, gates and pillars, and architects' charges of 800*l*. Messrs. John Gibson & Son, Malton, were the architects.

Cottenham.—New Board Schools for the parish of Cottenham were opened last month. The new schools adjoin the old British Schoolroom, and consist of a building with one story 62 ft. long and 22 ft. wide. The infants occupy the ground-floor and the girls the room above. Both schools are provided with class-rooms. There are two playgrounds—one for the girls and infants, the other for the boys. The buildings have been constructed by Messrs. E. Leach, J. Smith, and D. Ingle, of Cottenham, under the superintendence of Mr. Charles Wilson, of Histon, the total cost being about 2,500*l*. Accommodation is provided for 550 children.

Easter Ross.—The Portmahomack new Board School, Easter Ross, Inverness, has been opened. The school, which is said to be the largest yet opened in the north of Scotland, has five class-rooms of the following dimensions:—Infant school 68 ft. long, one class-room 45 ft., and the other three 25 ft. square. The building has a *flèche* 15 ft. high. The schoolmaster's house contains nine apartments. The architects are Messrs. Maitland, Tain; and the contractors were:—Mason work, Mr. Fraser, Portmahomack, carpenter, Mr. Murray, Inverness; slater, Mr. Ross, Alness; plasterer, Mr. Gallie, Inverness; plumber, Mr. Meikle, Tain; and painters, Messrs. Urquhart & Mackay, Tain.

CHURCH-BUILDING NEWS.

Rodmersham.—Towards defraying the cost of the proposed restoration of Rodmersham Church, Kent, 750*l*. have been raised, but 250*l*. more are required to commence. Sufficient money has been raised to build a vicarage-house for the parish. Mr. Seager, of Borden, has the contract, and it is hoped that the building will be completed by Michaelmas next.

Drayton Bassett.—St. Peter's Church, Drayton Basset, Tamworth, was re-opened on December 26th, after restoration and renovation. The church was built in 1793, on the site of an old church erected in the fourteenth century. About twenty years ago it was restored, at a cost of 2,000*l*., by Sir Robert Peel, M.P., of Drayton Manor, at whose expense the present repairs have also been carried out. The former ordinary pulpit, reading-desk, and fittings, have been replaced by others made of English oak, elaborately carved. The chancel-floor has been relaid with encaustic tile-paving, and the stone paving in the passages has been replaced by plain tile paving. The six two-light tracery-headed windows have been filled with ornamental and stained glass, bearing Scriptural quotations. The whole work of renovation has been carried out under the supervision of the architect, Mr. Edward Holmes, Birmingham, by the several tradesmen employed, viz.: Messrs. Clarson & Son, Tamworth (builder's work); Messrs. Jones

& Willis, Birmingham (new pulpit, &c.); Messrs. Minton, Hollins, & Co., Stoke-upon-Trent (tile paving); Mr. Higginson, Birmingham (the decorations); Mr. Bourne, Birmingham (stained glass); Messrs. Haden & Son, Trowbridge (heating apparatus). The total cost is about 800*l.*

Liverpool.—St. Aidan's Church, Liverpool, was consecrated on the 22nd ult. by the Bishop of Chester. The church is situate in Latham-street, Stanley-road, Kirkdale. St. Aidan's Church was originally built twenty years ago; but it was, a short time since, razed to make way for dock extensions, and the Mersey Docks and Harbour Board had to re-erect it upon another site. Messrs. Culshaw & Sons were the architects, and Mr. Urmson, of Soho-street, was the builder.

Old Malden.—About six months ago the foundation-stone of a new church at Old Malden was laid by the Bishop of Guildford. The consecration of the building took place last month. The building is of red brick, with Bath stone dressings, from the design of Mr. T. G. Jackson, architect, London. The cost is about 2,700*l.*, and the work has been carried out by Messrs. Goddard & Sons, contractors, Farnham and Dorking.

Miscellanea.

Charcoal Steel direct from the Ore.—At the meeting of the Society of Arts on the 22nd ult., Mr. Henry Larkin communicated a paper on "A Method of Producing Pure Charcoal Steel direct from the Ore." Abstracts of patents for hard-steel manufacture, taken out in the course of the last forty years by Mr. W. N. Clay, M. Chenot, M. Bellford, Mr. T. S. Blair, Mr. Joel Wilson, and others, were read, Mr. Larkin thence proceeding to demonstrate wherein consisted the improvements which he claimed for his own method. Any rich and pure ore, he states, is capable of satisfactory treatment, though it is more particularly to the reduction of magnetic iron ores that his attention has been directed. In these latter substances, after pulverisation the finely divided ore is separated out by means of magnetism, leaving the greater part of the impurities as a residual heap. The extraneous matter having been thus removed, the magnetic oxide is intimately mixed with any suitable carbonaceous material, such as charcoal or powdered resin, the mixture thus formed being compressed into bricks. These are introduced into horizontal retorts, heated on the principle of the Siemens' furnace, and, after exposure to a full red heat for nearly twenty-four hours, the charcoal becomes oxydised at the expense of the ore, leaving behind a powder of practically pure iron. This is removed in such a way as to avoid contact with air while the metal is in the heated state, and when cool the powder is mixed with the amount of carbon (in the form of resin) and of flux that may be deemed requisite, and having been again compressed into bricks is fused in crucibles into steel in the usual way.

Curious Painting discovered at Reading. A curious old painting was lately discovered on the plastering behind some panelling in the lower front room of a house lately demolished in Friar-street, Reading. The building was probably erected about the beginning of the sixteenth century, and the painting appeared to have been done about the same time, as it was on a plastic ground of lime putty and a great quantity of hair, on the face of the original clay (or wattle and daub) plastering, and formed a frieze to the room, the upper edge being close to the ceiling. The subjects are a part of apparently a number, illustrating the "History of Susanna," one compartment and the half of another being found in one piece, the half one representing three soldiers wearing helmets, one with an axe-headed spear, and an old man, the inscription over (written in Old English letters) being:—"Ye too Elders of their owne mouths." This compartment is divided by a pilaster from another which represents two naked men bound to a stake, and being stoned by three others. The size of this compartment is 36 in. by 32 in., and the inscription over it (also in Old English) as follows,—"The too Elders are stoned to death for bearing false witness against Susannah." On Mr. Albury, the secretary of the Archæological Society, hearing of the discovery, he proceeded to the spot, and successfully removed the whole entire. He is of opinion that the building was originally occupied by some society or guild.

The Artisans' Dwellings Act.—At the last meeting of the Leeds Guardians of the Poor, Mr. T. Winn brought under notice the misery inflicted on many families in Leeds by the recent destruction of many dilapidated hovels in order to make room for a new market and other public improvements. He especially dwelt on the condition of the occupants of 507 cellar dwellings in the North-east, East, and North wards, which are still permitted to be inhabited, but which it is intended by the authorities to close shortly. One of Mr. Winn's principal objects in bringing this subject forward was to confer with his colleagues as to what should be done when all cellar dwellings were abolished. Mr. G. Smith asked what the local philanthropists were doing amid all this desolation and general wretchedness. Let a flood or a fire come in America, and Englishmen's charity knew no bounds; but here it seemed was a want which up to now had remained without any responsive effort. Mr. Winn said, being himself engaged in the building trade, he could assure the guardians that if he had a thousand houses at low rentals in Leeds to let, he could find tenants for them at once. A resolution was passed by the Board, calling the attention of the Town Council to the advantage of exercising the powers given them by the Artisans' Dwellings Act, 1875, in order to remedy the great deficiency that exists in the number of suitable dwellings for the poorer classes of the inhabitants.

Masonic Window, Plymouth Guildhall. The design for the window which is to be placed in the Plymouth Guildhall, in memory of the combined meeting of the Freemasons of the Provincial Grand Lodges of Devon and Cornwall, to welcome the Prince of Wales, Grand Master of England, on the occasion of his opening the building in August, 1874, is ascribed to the Earl of Mount Edgcumbe, the Grand Master of the Province of Cornwall. To correspond with the other windows in the hall, the circle in the middle of the tracery is devoted to a portrait of the Prince of Wales. In the cinquefoils are the All-seeing eye, the Bible, the Crown, the badge of his Royal Highness, and emblems of Faith, Hope, and Charity. In the quatrefoils are the arms of the Prince, with a five-pointed star, and the arms of the Grand Lodge of England, with a six-pointed star. The tracery has appropriate Masonic borders. The design is so arranged that at the first glance it has the appearance of a subject picture; but closer examination shows that it has four distinct subjects, namely, Brotherly Love, a figure supporting another in distress; Relief, a female with child, receiving relief from a second figure, who consents to take charge of the child; Truth, a figure representing the Master Mason; Obedience, representing the fellow-craft and the entered apprentice. The window is to be executed by Messrs. J. Fouracre & Son, of East Stonehouse, Devon.

Manchester Tidal Navigation.—Some few years ago this subject was mooted in Manchester, and at the time excited considerable interest, but owing to the then unfavourable state of the money market and other circumstances, it was thought expedient to postpone its consideration. It is now understood that some gentlemen in London interested in the progress of the trade at Manchester have the matter under deliberation with a view of forming a company to carry out the undertaking. The proposal is to straighten, deepen, and widen the river Irwell from below Manchester downwards to its junction with the river Mersey. From this latter point it is intended to straighten, deepen, and widen the present channel of the Mersey to the sea below Liverpool. By this means it is proposed to provide a tidal channel from below Manchester to the sea, of sufficient depth to accommodate vessels of a like character to those which now navigate the Suez Canal, by which the embarkation and landing of goods and passengers at Manchester and the surrounding districts would be economised and accelerated. The total cost of the undertaking, including the construction of wharfs, railway bridges, and other matters, taking the present prices of labour and materials, is estimated by Mr. Hamilton Fulton, the engineer who has had this project in hand, at 3,500,000*l.*

New Font at Wath-upon-Dearne Parish Church.—A new font of Caen stone, with an oak top in the form of a pyramid, has been placed in Wath-upon-Dearne Church. It was designed by Mr. Hadfield, of Sheffield, architect.

Tewkesbury Abbey Church.—At the last meeting of the Tewkesbury Abbey Restoration Committee, Mr. Wood, from the office of Sir Gilbert Scott, attended to give some information as to the manner of decorating the roof. At the same meeting, a letter was read from the Rev. R. C. and Mr. T. J. Nightingale, offering to give, jointly, 500*l.* towards the restoration of the abbey, on condition that 500*l.* are subscribed by one or two other persons. The 500*l.* they propose giving they wish to be devoted to the recolouring of the roof, and the 500*l.* given to meet it they would like divided into two equal portions; one to be devoted to the cost of a reredos, and the other towards the restoration of the apsidal chapels. Mr. Wood explained that the gilding and colouring, parts of which were plainly distinguishable now the outer colouring had been removed, were in some instances peculiar to the building, and would give quite enough guidance to enable the workmen to paint and gild the bosses and other prominent parts exactly as they were before they were covered with wash. He also produced some estimates for certain parts of the work, and said that judging from these, he should think Mr. Nightingale's offer would about cover the whole cost.

A Monster Tree.—The *Omaha Bee* gives a full description of a section of a big tree of California arrived in that town on its way to the Philadelphia Centennial Exhibition. The *Bee* says:—"The tree grew on the west slope of the Sierra Nevada, at an elevation of 6,500 ft. above sea level. The age of the tree as indicated by the yearly rings was about 2,250 years, the rings being so close on the outer edge that it was almost impossible to count them. The height was 276 ft. The diameter at the surface of the ground was 26 ft.; 100 ft. above the ground, where the first limbs project, 14 ft.; and 200 ft. above the ground the diameter was 9 ft. The bark averaged 1 ft. in thickness, and in some places it was 1 ft. 4 in. thick. The bark of some of this species of tree is 3 ft. thick. The estimated number of lumber feet that it would make was 375,000, and the number of cubic feet about 31,000,—enough to make lumber and posts for sixteen miles of ordinary fence. The weight of the wood when first cut was 72 lb. per cubic foot, making the weight of the lumber-producing portion 2,232,000 lb. It took two men ten days' hard work to fell the tree, and when it fell it broke in several pieces."

Smothered.—An inquest has been held on Sarah Ann Walker, a domestic servant, in the employ of Mr. Manners, at 21, Newcastle-street, Strand. The deceased was found dead in her bedroom, and it was stated that, having partly fallen out of bed in an epileptic fit, she had been unable to free herself, and was suffocated with the clothes which covered her. Mr. Dunn, the surgeon who was called to her, said the place in which he found her was wretchedly small, without any ventilation. The air was very impure, and it was a wonder she could have slept there at all. The father of the deceased said he had seen the room. It was the shape of a grand pianoforte, not longer than the table the jury sat at. There was no fireplace in it, and no window. It was only lighted from above. The verdict was,—"That deceased died from suffocation, produced by falling from bed while in a fit, and the said death was accelerated by want of proper sleeping accommodation and pure air and space." The unhealthy holes in which thousands of domestic servants sleep would astonish those who have not inquired. We have before now given sketches of such places, which are found in the basements, the roofs, and under the stairs.

Fall of a Warehouse in Manchester.—Shortly after three o'clock on the morning of the 28th ult., a large warehouse in course of erection in Marsden-street, Manchester, fell in. The warehouse was nearly finished, and occupied a large space of ground, with a frontage of about 27 yards in Marsden-street, extending a depth of 25 yards to Back Marsden-street. The building is called the Marsden Chambers, and is the property of Mr. Cotterill, manufacturer, Southport. Messrs. Winder & Metcalfe, Back-square, St. Ann's-square, were the architects, the contractors being Messrs. R. Neill & Sons, Strangeways. The premises were four stories in height, and the back portion was so far completed that the principals had already been placed. There had been no indication of weakness, the workmen, numbering forty, having left the premises the previous evening. The building was erected on the fireproof principle. Fortunately, no one was within the building when it fell.

Proposed New Assize Courts and Town-hall, Newcastle-on-Tyne.—A special meeting of the Newcastle Town Council was held on the 15th ult., for the purpose of receiving and considering a report from the Assize Courts Committee, relative to the proposed erection of new assize courts and other buildings adjacent thereto. The report premised that, after fully considering the matter, the committee were satisfied that by converting the corn-market into shops, removing the corn-market into the town-hall, letting the present council-chamber and corporation offices for commercial purposes, and disposing of the Guildhall, Moot-hall, and Mansion House in Ellison-place, they would be enabled to erect more eligible buildings in lieu thereof in Northumberland-street, without entailing either upon the county or the town the risk of much additional burden. The motion for the adoption of the report was negatived by twenty-one to twenty.

A Big Bridge.—The *Montreal Daily Witness* of the 9th ult. gives particulars of the plans prepared by Mr. Legge, C.E., for the Royal Albert Bridge, which is to span the St. Lawrence at Montreal a little lower down than the Victoria Bridge. It is to accommodate a railway track, carriage and cart traffic, and a tramway line, and provision is also to be made for pedestrians. Its total length will be 15,500 linear feet, or very nearly three miles. It will have one arch of between 500 ft. and 600 ft. clear span over the navigable channel of the St. Lawrence, with a height of 130 ft. above the water at high tide; five of 300 ft. each at the same height, four of 240 ft. each, and fifty-one of 200 ft. each. The estimated cost of the bridge is $4,000,000 (800,000*l.*), and its erection, which will commence next spring, is expected to occupy three years. The Victoria Bridge, which has hitherto passed for being the largest in the world, is only 7,000 ft. long, with one arch of 330 ft. span and twenty-four of 242 ft. span. Its construction occupied six years, and the total cost was 1,260,000*l.*

The Mineral Wealth of England.—From the report about to be issued by Mr. Hunt, Keeper of Mining Records, it appears that the total value of minerals and metals, coals, &c., obtained in the United Kingdom in 1874 was:—Of metals, 19,539,070*l.*; of coal, 45,849,194*l.*; and of minerals, earths, &c., 2,446,049*l.*; making a total of 67,834,313*l.* This shows a decrease in the value of the metals and minerals, produced from the mines of the United Kingdom in 1874, as compared with values given in the returns of 1873, of 2,888,679*l.* This falling off is in the coal and iron, the falling off in the value of coal being 1,782,086*l.*; ditto of pig iron, 1,581,367*l.*; ditto on other metals, 288,981*l.*; total decrease in the value of coal and metals, 3,652,434*l.*; while there has been an increase on the value of the earthy minerals of about 764,500*l.*

Old Malton, Yorkshire.—Alterations and additions to this school are completed. The work executed consists of rebuilding a large portion of schoolroom, new yards, and offices, and the erection of a turret on the roof, this acts as a ventilator to the schoolroom, and contains a clock with bell and two dials, made by Messrs. T. Cooke & Sons, of York, the gift to the village of Mr. Henry Hurtley, of Old Malton. The turret is constructed of timber with glass louvres round the portion containing the bell. The spire is covered with lead and slates, and surmounted with wrought iron vane and weather-cock. The works have been carried out by Mr. John Wood, builder, Malton; Messrs. John Gibson & Son, Malton, being the architects.

The New Free Library for Wigan.—On the 21st ult. the Mayor of Wigan received from the trustees under the will of the late Mr. J. T. Winnward, surgeon, of Wigan, the sum of 11,300*l.*, which was bequeathed for the purpose of purchasing books for the new free library at Wigan, which Mr. Thomas Taylor, cotton spinner, of Wigan, had, at the time of Mr. Winnward's death, promised to build at an expense of 5,000*l.* Plans have been prepared by Mr. Waterhouse, and the building is being erected on the site of the old Wigan Free Grammar School. It is stated that the cost to Mr. Taylor will be fully double the amount named.

Employment of Children in Brickworks. At the Stourbridge Police Court, Mr. T. Rhodes, brick manufacturer, has been fined 2s. 6d. and costs in four cases, for employing young persons under the prescribed age in his brickworks. He said he would see in future that no one was employed till he had seen the register himself.

A Mediæval Bell.—Efforts are being made to collect sufficient funds for the restoration of the parish church of Brailes, Warwickshire. The tower of this ancient church contains one of the heaviest peals of six bells to be met with in this country. Unfortunately, they are so badly hung and out of repair that twenty men and boys find it a toilsome and difficult task to bring out their melody, and the tenor and third bells are badly cracked. The former is a Mediæval bell, weighing about 34 cwt., and much admired by archæologists. It bears the arms of the Underhill family, with the following legend, probably a stanza of some ancient Ascension hymn:—

"Gaude quod post ipsum scandis,
Et est honor tibi grandis
In celi palacio."

It is proposed to recast this bell, exactly reproducing its interesting features, and also the other cracked bell.

V-Shaped Groynes.—Mr. Holt, of Hastings, has proposed a new kind of groyne or breakwater. He proposes to form the groyne of a V-shape, entirely of iron screw piles. For familiarity of illustration it may be stated that each pile would be somewhat the shape of an extinguisher. The apex, or point, would be the screw portion. The broad end would be made hollow, with a circular outlet in the side, 2 ft. or 3 ft. below. In a south-west gale the sea would strike on the western arm of the groyne; and the water would rush between each pile and also into the hollow top part (as into so many gully-gratings in the street). Inside the V the raging water would become partly quieted, and would escape through the openings at the side of the eastern arm, where the waves would be running with much less force.

The Colosseum, Rome.—Mr. J. H. Parker, in a letter to the *Times*, states that the interesting substructures of the arena recently discovered are now 10 ft. under water,—not from any flood, but from the blundering of the Roman workmen, who made a hole in an aqueduct and sent all the water into these substructures. He adds,—"Nothing can be done until the water is pumped out, and this can only be done by the steam-engine, which has been stopped for the last four months 'for want of funds.' Can no one be found who has money enough and liberality enough to give 100*l.* to pump this water out, and allow these interesting substructures to be seen, and a drain made to carry off the water in future?"

Chimney Construction.—At the Haslingden Petty Sessions, four builders, one of them a member of the Haslingden Local Board, were recently summoned for a breach of the 3rd and 4th Vict., chap. 85, which relates to the construction of chimneys. Three were summoned for two offences under the Act, viz., for building the partition "withs" 1 in. instead of 4½ in. thick, and for not rounding the angles of the chimney, the latter defect making it necessary for the chimney-sweeper to go on the roofs of houses to sweep the chimney. The lowest penalty was 10*l.* for each offence, but it was arranged for defendants to pay 5*l.* and costs in both cases, except in one, where the person summoned was not the master builder.

Alnwick Working Men's Club.—A public meeting was held in the town-hall, Alnwick, last week, under the presidency of the Duke of Northumberland, for the purpose of opening a working-men's clubroom. A building has been erected at the cost of his Grace in connexion with the baths and washhouses. The Duke, in delivering the opening address, expressed himself willing, if necessary, to be responsible for the taxes and rates until the club got thoroughly under way. Several interesting speeches were delivered. An address was presented to the Duke in acknowledgment of his kindness in providing the inhabitants of Alnwick with such a building, which was subsequently declared to be duly opened.

The Liverpool Borough Engineer's Salary.—A proposal is being considered by the Health Committee of the Liverpool Town Council to increase the salary of Mr. Deacon, the borough and water engineer, from 1,000*l.* to 1,300*l.* a year. At the present time Mr. Deacon's salary is chargeable to the Health and Water Committees in the sum of 600*l.* and 400*l.* respectively, and the Water Committee will be asked, with the consent of the Town Council, to contribute 650*l.*, instead of 400*l.*, whilst the Health Committee will raise their contribution to the same amount, which will make 1,300*l.* a year.

Proposed Embankment of the Thames at Windsor.—A meeting was held in the town-hall, Windsor, on the 23rd ult., for the purpose of considering the question of erecting a bank along the south shore of the Thames between Bier-lane and Clewer church. The mayor, having referred to the discomfort and privation caused by the late floods, Mr. Thomas Buckland explained a scheme for the erection of a bank about 6 ft. high between Bier-lane and Clewer Church, which might be formed of ordinary mould, and would keep the water from flooding the suburbs of the town. A committee was appointed to take steps to effect the proposed improvement.

New Mansion at Kingsclere Woodlands. The erection of the mansion which has just been built at Kingsclere Woodlands, by Mr. W. Holding, from plans furnished by Mr. W. Drake, was celebrated by the workmen on the 21st ult., when, through Mr. Holding's liberality, they were entertained at supper. The mansion has been built mainly of brick, at a cost of upwards of 7,000*l.*, by Mr. Samuel Elliott, of Newbury. The health of the founder of the feast was drunk with great enthusiasm, as also the healths of the architect, builder, clerk of works (Mr. West), and the foreman (Mr. Stringer).

Waste of Water.—A remarkable report, prepared by Mr. Gale, the engineer, was read at the last meeting of the Glasgow Water Committee. It detailed the results of experiments which had been made in five districts of the city for discovering and reducing waste of water, setting forth that the defective fittings found consisted of three classes,—burst service-pipes, fittings out of repair, and fittings both not in conformity with the rules and out of repair. The waste had been reduced twenty-five gallons a head, or 127,375 gallons a day, over the population operated upon. The committee authorised further experiments over a larger area.

The Sewerage of Ipswich.—At a meeting of the Ipswich Town Council, on the 22nd ult., it was resolved, on a motion by Mr. E. R. Turner, that Mr. Bruff, C.E., should be instructed to prepare plans and specifications for the sewerage of the town on the north side of the Orwell, in accordance with his report of September 18th, 1875, the plans to include the provision of means for arresting suspended matter at the outfall, and dealing with the storm water, to be so arranged as to admit at any time of additional works for the more elaborate treatment of the sewerage, if found necessary.

Restoration of an Irish Mansion.—Downhill, the Irish residence of Sir H. Hervey Bruce, bart., has just been altered, partially rebuilt, and enlarged, the works having been in progress for over two years. Until the works just completed were commenced, the building had been, since it was burnt down in 1851, little more than a ruin. All the works have been carried out by Mr. James Henry, of Belfast, under the superintendence and direction of Mr. John Lanyon, architect, Belfast.

The Aylesbury Sewerage.—At a recent meeting of the Aylesbury Local Board of Health, a committee was appointed to consider the question of the disposal of the sewage of the district. The committee was authorised to consult Mr. Hawksley, and requested to report fully to the Board on the system of dealing with the sewage which Mr. Hawksley might recommend to be adopted.

Illustrations of St. Alban's Abbey.—Mr. Jas. Neale, architect, is about to publish a volume illustrating the "Ancient Abbey of St. Alban." The drawings have been worked to scale, and checked on the spot, all jointing, &c., measured, and the mouldings taken real size. They obtained for the author, from the Institute of British Architects, the "Pugin Travelling Studentship."

The Fairbairn Memorial, Manchester.—Some squabbling is going on concerning the manner in which the sculptor for this work has been appointed. The question rested between Mr. Woolner and Mr. Geflowski; the former naming 1,500*l.* as the price, the latter 750*l.* The appointment of Mr. Geflowski was ultimately carried.

The Artisans' Dwellings Company.—Lord Shaftesbury has resigned the office of president of this association, the directors having failed to circulate amongst the shareholders a series of reports which it is thought necessary the shareholders should see. We wait further information.